

## X. COMMENTS

In this section are found all substantive comments offered on the draft statement along with an appropriate response to each. The majority of the comments were contained in 20 letters received in response to the July 6, 1976 Federal Register announcement of issuance of the draft statement which also included a solicitation for comments and views from interested individuals, organizations, and government agencies. Those written comments can be divided into seven general topics:

1. The Long-Range Waste Management Program including requests for information on plans for the disposition of radioactive wastes presently stored at INEL, and on improvements planned or implemented for better handling of wastes, after the draft statement was written.
2. Transportation of Waste Materials including requests for information on the potential impacts of offsite transportation accidents.
3. The INEL Hydrogeologic System including requests for additional details on the hydrologic, seismic, and volcanic aspects of INEL.
4. Radiological Dose Assessments including requests for environmental radiological dose estimates by isotope and exposure pathway, and information on the doses of radiation received by INEL employees.
5. Leakage from Buried Waste Lines including requests for additional information on leak-testing programs.
6. Disposal of Waste Water Directly into the Snake River Plain Aquifer including questions on the specific radioisotopes so disposed, their distribution in the aquifer, and their impact on potable water supplies.
7. Control of Transuranics at the RWMC including requests for monitoring data, soil sampling data, and data on potential migration downward in the earth beneath the storage areas.

In addition, comments were provided orally by various witnesses participating in the public hearings on the draft statement. Finally a number of comments were provided as a part of the written report of the Presiding Board for those hearings. Responses are given to all of those comments as well.

Comments calling attention to organizational, typographical, grammatical, and orthographical errors are acknowledged but not explicitly responded to. These mistakes have, however, been corrected in the course of preparing the final statement.

Section X is organized in two parts: (1) Comments from the Report of the Presiding Board and comments provided by witnesses at the board hearings plus letter comments received on the Draft Environmental Statement from other interested parties, each comment being accompanied by a response from the ERDA staff; (2) the full text of all comment letters (exhibits in Subsection X.21). Section X.0 contains comments and recommendations from the presiding board of, and comments from witnesses present at, public hearings held on the Draft Environmental Statement in Idaho Falls, Idaho on February 1, 1977 and in Boise, Idaho on February 3, 1977. Sections X.1 through X.20 contain comments received in letters.

In some cases, to lend additional perspective, responses may include material peripheral to the immediate questions raised in the comments. Page numbers used in comment letters are those used in the DEIS issued in June 1976 and not the pages of this document.

For the reader's convenience, the following index to the comment letters from interested parties is provided.

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X.0 Statement of the Presiding Board Identifying Views and Issues  
(Plus Appendix)

X.0.1 Organization

"For a complex site such as INEL, preparation of a balanced presentation of the environmental issues with adequate attention to the stated concerns of non-technical persons is most difficult. For that very reason, such preparation deserves a degree of attention far beyond that which is currently evident. While there is no established model, it appears to the Board that the Hanford site is about equally complex, and that its problems have been presented effectively in the parallel document, ERDA-1538. How the issues are addressed in the corresponding Savannah River Report ERDA-1537, may also be of help in considering any reorganization and revision of the final environmental statement. In addition, the draft statement does not appear to state its reference points as to what health and environmental guides are being used; only occasional references to ERDA Manual Chapters, and the recommendations of NCRP and ICRP, appear."

Response

The parallel document, ERDA-1538, has been reviewed and applicable portions have been used as examples in finalizing this statement. A complete discussion on guides and standards for the waste management program at INEL is included in the Summary of the statement. Much of the material of these guides is, when applicable, reiterated and reinforced throughout the statement.

X.0.2 Omissions

"The omissions most frequently noted were failure to mention small releases of long-lived radioactive constituents to the atmosphere or to the ground. In some of these cases, perhaps the omissions were a result of the reporter's knowledge that the omitted nuclides contribute a negligible fraction to the relevant total hazard. Unfortunately, the concerned public does not have that information; it reasonably concludes that the omissions are contrived to improve the image of waste management. This type of misunderstanding should be corrected. To the extent possible, full disclosure of all long-lived emissions, no matter how small, is desirable."

Response

There was certainly no intention to falsely present an improved image of waste management practices through failing to mention the releases of negligible quantities of radionuclides in the draft statement. However, in response to the criticism, an attempt has been made in the final statement to include all released nuclides, no matter how small a fraction of total nuclides released they might be. As noted in the statement, the semiannual Waste Management Information System (WMIS) reports do list all radionuclides known to be released, regardless of the magnitude of such releases. All releases identified in the WMIS reports have been included in the appropriate tables in the final statement.

X.0.3 Unresolved Specific Issues

"A principal area of comment and concern was omission of reference to commitments made to then Governor Cecil D. Andrus by AEC Chairman, Dr. Glenn T. Seaborg, and the later Chairman, Dr. Dixie Lee Ray. These commitments concern the removal 'of all radioactive wastes, both those buried under ground and those stored above ground, from above the Snake River Aquifer, starting at the end of this decade.' (From Comment Letter #15, Governor C. D. Andrus). The opening staff statement at the hearings recognized this omission and indicated an intent to correct it. The final statement should describe these understandings in unequivocal terms."

Response

A new section (III.B.5.f) has been placed in the final statement discussing the controversy over burial of transuranic wastes at INEL, statements and actions of AEC concerning these wastes, and planning by ERDA concerning their long-term management.

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(Plus Appendix) (Continued)

X.0.4 Future Studies

"A number of Government agencies and private persons expressed serious concern with what may happen to the vital Snake River Aquifer resulting from 'importation' of military waste sources, both the transuranic wastes from Rocky Flats and the spent Naval reactor fuels processed at the ICPP. They called for the projection of the amounts of these wastes into the future. While such a projection by the staff, of military needs is impracticable, perhaps the final statement could address this issue by providing reference to, and some degree of integration with, the two more detailed supportive documents to be issued in 1977, viz:

- (a) Alternative methods for the long-range management of calcined high-level wastes, and
- (b) Alternatives for the long-range management of the transuranium-contaminated wastes received at the INEL since 1954.

At the Boise hearing, the staff response to the concerns of the State of Idaho Department of Water Resources indicated that two other related documents are in preparation, viz:

- (c) Risks and consequences of failure of the Mackay Dam.
- (d) Reassessment of the seismic risk."

Response

The subject of "importation" of military waste to INEL and alternatives to it has been addressed briefly in the expanded chapter on alternatives (Section V). The two alternative studies for the long-term management of calcined wastes and transuranium contaminated wastes are briefly discussed and referenced in this section. These documents are scheduled for release in 1977. The last two documents cited are also in preparation and will be released in 1977.

X.0.5 Statement Update

"It was also noted that a geological-hydrological study covering USGS work at the site from 1952-1970 was formally issued in January 1977. This is the same actual data as in Reference 76 p. X-5 of the draft statement, but it is there described as being issued by the AEC, Idaho Falls. It seems, then, that a projection of the type the public requires cannot be completed at this time. In fact, there may be no point in time that would be wholly satisfactory. Therefore, the Board recommends that consideration be given to modification of the present statement so as to make it as responsible as possible to present public needs, and that a firm commitment be made to publish an updated statement, with appropriate public hearings, at intervals of about 10 years. The Board would visualize that process continuing until the public accepts that the health and welfare of the communities around INEL are indeed protected from the predictable effects of the waste management operations."

Response

The overall status and currency of the Environmental Impact Statement will be reviewed regularly. In addition it will be supplemented approximately annually by two key documents: an INEL Waste Management Plan and a Site Environmental Monitoring Report. In addition, any major program changes will be documented in formal environmental assessments. It may be appropriate at some future time to prepare a revised baseline document.

X.0.6 Sampling for Biological Contaminants

"The Snake River Aquifer was also the subject of a related concern involving the discharge of biological wastes from INEL operations. Apparently, an adequate off-site sampling program

X.0 Statement of the Presiding Board Identifying Views and Issues  
(Plus Appendix) (Continued)

X.0.6 Sampling for Biological Contaminants (Continued)

is needed that will give assurances to the public that any migration of biological, as well as radioactive material will be detected and evaluated. The final statement should discuss this subject, particularly with respect to well sample monitoring."

Response

Potable water samples are taken, on a monthly basis, at all INEL facilities and are examined for biological contaminants. A paragraph has been added to Section III.B.4 describing this program and its results.

X.0.7 Cost-Benefit Analyses

"The Board generally agrees with the comments criticizing the cost benefit analyses as being either superficial or written in such a manner as to require too much knowledge from the reader. As noted and discussed at the hearings, the final statement should be revised to address this issue."

Reponse

The alternatives section of the statement has been completely rewritten and strengthened. The text of the cost-benefit section has been edited and clarified but the basic cost-benefit data presented in tables remains unchanged. The viable alternatives to, or improvements in, present waste management methods and practices, as identified in Section V, have been subjected to cost-benefit analyses. The results of most of the analyses are presented in Section IX in tabular form, and are expressed in dollars cost per decrement of waste material reaching the environment or in dollars cost per decrement in radiation exposure to the general public.

X.0.8 Presentation of Material

"In addition, the final environmental statement should be structured and presented so as to serve the needs of both the scientist and technical person as well as the responsible public layman."

Response

This is a difficult task. The statement necessarily addresses scientific questions and such questions and issues frequently must be answered in scientific terms for the sake of precision. The document has been written primarily in generally accepted technical terms. From the type of questions raised by lay witnesses at the hearings and from the kind of queries received in letters from laymen, it appears that some lay witnesses had received, in certain areas, incorrect impressions and had drawn incorrect conclusions. The responses to comments resulting from any incorrect impressions or conclusions hopefully provide satisfactory resolution of these problems. In addition, numerous changes in text, tables, and other illustrations have been made for clarification of points which obviously had not been correctly understood.

X.0.9 Geology and Hydrology

"Refer to Comment Letter #18, Dept. of the Interior (p. 2), Comment Letter #17 Environmental Protection Agency (e.g., p. 2 and pp. 14-9), and A. K. Dunn's statement.

The comments refer to the meager descriptions of geologic, and hydrologic conditions, and the need for interpretive maps, and cross sections. The risks and consequences of potential flooding of the site are not addressed. The specific issues relating to the Mackay Dam were referred to by several participants."

X.0 Statement of the Presiding Board Identifying Views and Issues  
(Plus Appendix) (Continued)

Response

See the response to comment X.18.3 which provides additional information on geology/hydrology. The problem of potential long-term flooding and failure of the Mackay Dam is the subject of a current study to be completed in late 1977.

X.0.10 Seismicity

"Refer to Comment Letter #17, EPA, p. 17, and A. K. Dunn's statement. The report refers to an upgrading from Seismic Zone 2 to Seismic Zone 3 with no reference to consideration of retrofit. Elsewhere, it describes the desert plain as an aseismic zone. This discrepancy should be resolved in the final statement and serious consideration given to the EPA suggestions."

Response

In response to this comment and others, additional information has been provided in Section II.C.8. An extensive response on seismology is found in Section X.17.62. See also response to comment X.18.24.

X.0.11 The <sup>129</sup>I Issue

"Refer to Comment Letter #11, P. G. Voilleque' and his oral statement, Comment Letter #17, EPA, (e.g., p. 4), Comment Letter #18, Dept. of the Interior (p. 7), O. J. Elgert comments (unnumbered).

The 68 mrad/yr dose for an antelope thyroid is disturbingly high for a material with a half-life of 16 million years. If there are natural factors that will prevent the thyroid accumulation from steadily increasing if the effluent releases continue, these should be fully explained. Tables of radionuclide release do not properly account for <sup>129</sup>I. As this nuclide was not separately measured upon release, the best estimate should be developed."

Response

See the responses to comments X.11.3, X.17.9, and X.18.15. Data on estimated I-129 releases have been incorporated in the final statement in Section III.B.1.

X.0.12 Terminology

"Refer to written and oral statements of A. E. Wilson, Comment Letter #18 (p. 1), and Comment Letter #17 (e.g., p. 5).

Some of these comments refer to ambiguous use of such terms as storage, disposal, burial, and discharge. Others call for definition of dose-related units such as rad and rem, and yet others refer to unconventional usage of the term 'man-rem.' The Board believes that accurate terminology contributes to readier comprehension of the statement. In addition to suggested additions, a closer technical scrutiny of all the definitions in the Glossary is recommended."

Response

The glossary (Appendix B) has been expanded and more precise definitions included. The written text has been reviewed to ensure that terms are used in the context of precise definitions to minimize possible misinterpretations.

X.0.13 Calculational Methods

"Refer to Comment Letter #16, Nuclear Regulatory Commission (p. 3). The comment refers to the calculational method for environmental doses arising from gaseous effluent release, which

X.0 Statement of the Presiding Board Identifying Views and Issues  
(Flux Appendix) (Continued)

X.0.13 Calculational Methods (Continued)

is claimed to be obsolete. The Nuclear Regulatory Commission has promulgated two Regulatory Guides, RG 1.109 and RG 1.111, which are widely accepted. A comparison with the values obtained using these guides should be considered for the final statement.

It may be noted that the International Standards Organization (ISO) is currently attempting to develop an internationally accepted model for this purpose. The final environmental statement should address that standard if it becomes available before the environmental statement is completed."

Response

A comparison has been made between calculational methods suggested in the newer Regulatory Guides RG 1.109 and RG 1.111 and the calculational methods used in this statement. The two calculational methods are comparable. The radiological doses presented in the statement from the gaseous effluent releases are conservative values. The standard being developed by ISO had not become available at the time of editing the final statement.

X.0.14 Doses to Maximum Individuals

"Refer to Comment Letter #17, EPA, Comment Letter #11, P. G. Voilleque, and the O. J. Elgert comments. These comments refer to the desirability of estimating potential radiological doses to the so-called maximum individual. He is pictured as one whose dietary and other living habits contribute to his receiving a dose perhaps many times the average. For example, in the present context he may be a vegetarian who grows his own food in the area most affected by radioiodine releases.

Presentation of such data is generally felt to give a realistic appraisal of the upper limit of radiation risk to an individual."

Response

A new table providing estimated maximum radiological doses to individuals has been included in the Summary section of the final statement (Table I-2). It should be reemphasized that no one individual is expected to receive this upper limit of radiation from INEL sources.

X.0.15 Background Doses

"Refer to Comment Letter #16, Nuclear Regulatory Commission and the O. J. Elgert comments. Both of these sources point to various discrepancies. In particular, an apparent sharp difference between measured components and estimated values for the same components, needs to be explained. Revision of the data should include change of terminology in the summary Table II-LXI on page II-339. As it stands a 'cosmic (nonionizing) source' giving 19 mR is a technical incompatibility."

Response

See the response to comment X.16.8. The "nonionizing" component of cosmic radiation relates to cosmic neutrons which are relatively nonionizing in the atmosphere, but which contribute significantly to personal background through interaction with the hydrogenous material in the body. Table II-63 has been reworded to avoid confusion.

X.0.16 Meteorological Consequences of <sup>85</sup>Kr

"Refer to Comment Letter #13, Neal Wilson. This relates to an assertion in an article in SCIENCE 193-195, 1976 that ionizing gases in the atmosphere may have meteorological consequences.

X.0 Statement of the Presiding Board Identifying Views and Issues  
(Plus Appendix) (Continued)

X.0.16 Meteorological Consequences of <sup>85</sup>Kr (Continued)

The comment deserves to be addressed, although the answer may be that the issue is argumentative, and is being studied by established scientific review groups."

Response

See the response to comment X.13.

X.0.17 Cost-Benefit

"Refer to Comment Letter and Hearing Comments, ERG, Inc. The specific comments submitted by Mr. Marc W. Goldsmith relating to the cost-benefit portions of the statement are relevant and should be considered in a revision and strengthening of the statement."

Response

The cost-benefit section of the statement has been reworded to be consistent with the wholly revised and strengthened alternatives section. The basic cost-benefit data presented in tables is still applicable and remains unchanged. (See response to comment X.0.7.)

X.0.18 Omissions and Structure

"Refer to Comment Letter and Hearing Comments, Paul Kiepe. The observations made by Mr. Kiepe should be checked against the draft in the preparation of the final statement, in particular the comment on the need to make the statement more readable to the concerned layman."

Response

The testimony and letter comments have been reviewed. Specific letter comments by Mr. Kiepe have been responded to in Section X.8. Text changes have been made where applicable.

X.0.19 Storage of Commercial Spent Fuel

"Refer to Comment Letter #9, Public Service Company of Colorado. In view of statements by both the Public Service Company and INEL staff, the status of storage of spent fuel from the Company should be addressed in the final environmental statement. This would apply equally to other commercial spent fuels not specifically recognized in comment letters."

Response

See Section X.9. The handling of the fuel in question (Ft. St. Vrain fuel) is a rather special case of commercial fuel and represents the federal government's commitment to this unique reactor and type of reactor fuel for which no commercial processing facilities are available. This is recognized in Section II.A.3 of the final statement and the environmental statement on Ft. St. Vrain is referenced.

NOTE

In the following parts of Section X.0 the principal oral comments made by witnesses at the public hearings held in Idaho Falls, Idaho on February 1, 1977 and in Boise, Idaho on February 3, 1977 are listed. In many cases these oral comments are similar to or identical with comments received earlier in written form. In such cases, the oral comments are not separately listed, but are covered in the appropriate parts of Sections X.1 through X.20. A few of the witnesses'

X.0 Statement of the Presiding Board Identifying Views and Issues  
(Plus Appendix) (Continued)

Response (Continued)

NOTE (Continued)

comments were extracted and quoted in the statement of the presiding board. In such cases, the witness' oral comment is not responded to directly. Instead the response is given after the comment quoted from the presiding board's statement. Finally, a number of witnesses' comments are not specifically noted, when the comment had been satisfactorily answered in subsequent testimony by the staff present at the hearing.

IDAHO FALLS, IDAHO HEARINGS OF FEBRUARY 1, 1977

X.0.20 Oral Testimony of Albert Wilson, 4017-B Nora Ave.,  
Pocatello, ID 83201

Comment

"The problems in using these terms (storage and disposal) appear throughout the document . . . . I would suggest that the terms 'storage,' 'disposal,' 'burial,' and 'discharge' be defined in the glossary of terms. The use of these terms should then be made consistent with the definitions . . . . That is where the real ambiguity lies. There is not a clear definition of what is storage and what is disposal."

Response

See earlier comment in X.0.12.

Comment

"Both Table II-31, page II-129 and Table II-53, page II-224 contain numbers which cannot really be correct. The problem involves the decay of a long-lived parent to a short-lived daughter . . . . The above comment may seem trivial at first glance, but I feel that it really raises a serious question."

Response

The values quoted in the cited tables have been restated to reflect correct parent-daughter relationships and provide consistency.

Comment

". . . the relation between the waste isolation pilot project and INEL waste could be included."

Response

See Comment X.0.4. The waste isolation pilot project and its relationship with INEL waste will be included in the alternative study on long-term management of INEL buried TRU wastes. This document will be completed in 1977.

X.0.21 Oral Testimony of Marc W. Goldsmith, Energy Research Group,  
1661 Worcester Road, Farmingham, Ma 01701

Comment

"The statement should specifically state the scope of the agency program that is the subject of this assessment, the program evaluation that the environmental statement is intended to accomplish, and the conclusions of that assessment; that is, demonstration that the proposed federal action, in this case, the continuation of current program operations is appropriate in light of available alternatives."

Response

The conclusions of the assessment are included in the Summary of the statement and in more detail in various parts of Section III. The section on alternatives has been entirely rewritten to address available alternatives to current program operations.

Comment

"There must be some explicit cost-benefit justification for the transportation of, for example, spent fuels from the East Coast and plutonium contaminated waste from Rocky Flats, rather than processing and disposal on or near the site of their generation."

Response

See the response to comment X.17.3. Although spent military fuels from East Coast locations are sent to INEL for recovery they are not primarily wastes. Broad cost-benefit analyses of shipment to INEL for reprocessing versus processing and disposal on the East Coast are periodically considered on a general basis. Since costly and unique facilities (multiple head-end reprocessing for highly enriched fuels) are available, detailed cost-benefit analyses have not been deemed necessary. The conclusions clearly point to the advantages of continued shipment to INEL.

Comment

"It is very disturbing to see an offhand reference to WASH-1238, which is the environmental survey of the light water reactor fuel transportation, as the basis for demonstrating that the transportation of fuels is of minimal consequence."

Response

The management of shipments of materials from offsite locations to INEL is not a part of the INEL waste management program, and offsite to INEL shipping accidents have not been considered in the statement. Information presented and references cited are for the benefit of any reader who may wish more information on the subject. See also response to comment X.17.1.

NOTE

The oral comments of Mr. Goldsmith, recorded on pages 39 to 47 in the hearing record, are essentially identical with those earlier transmitted by letter. These comments and responses are found in Section X.20 and are not duplicated here.

Comment

"In the early 1980s, we will have a standard for krypton-85. There is no discussion in this document whether the CPP in the early 1980s will meet the krypton-85 standard."

X.0.21 Marc W. Goldsmith Oral Testimony (Continued)

Comment (Continued)

Commercial reprocessing facilities are being mandated to put krypton-85 equipment on now. There is no discussion of that alternative.

The vitrification versus calcination problem, I believe, is not properly or adequately addressed in this document, as some specific examples of those things that we have problems with."

Response

Concerning ICPP meeting possible new standards on Kr-85 releases, see response to comment X.17.12.

The alternatives of vitrification of high-level waste versus calcination are discussed in the rewritten section on alternatives. It should be mentioned that calcining of waste does not preclude the waste later being incorporated into vitrified or other low leachable form if desirable.

Comment

"I think the Albuquerque-Carlsbad Salt Mine raises some additional questions, as far as transportation now. And I was aware that that program was proceeding -- I was not aware that the INEL wastes were going to go down there. And I think that raises some additional cost-benefit questions.

Would it be better to be near the location of terminal storage? Are the hazards from transporting that waste, which I don't believe are high-level hazards, great enough to warrant some other location. I am not sure that that is the case, but that would be an example of something that should be in the impact statement.

If this is not going to be a terminal facility, then should they be reprocessing, and solidifying high level materials at this location."

Response

The rewritten section on alternatives mentions alternatives for processing fuel at other locations with respect to final disposal of processing wastes. Further details are provided in a document, scheduled for publication in late 1977, on the subject of alternative methods for the long-range management of calcined high-level wastes.

X.0.22 Oral Testimony of Dennis Donnelly, 532 North Hayes, Pocatello, ID 83201

NOTE

Most comments provided in Mr. Donnelly's oral testimony are identical with those received from Mr. Donnelly in a formal comment letter. Responses to those comments are found in Section X.12.

Comment

"This next sentence is what I hoped to emphasize. 'However, the shortened storage (of irradiated commercial LMFBR fuel) period of 30 days introduces new problems in fuel reprocessing because of the large amount, 3.6-million curies/yr of radioactive iodine fission products remaining after 30 days.' That's the end of what I wish to quote from that article, but I think it has major implications when you're reprocessing fuel here in the backyard."

X.0.22 Dennis Donnelly Oral Testimony (Continued)

Response

The shortened cooling period before processing breeder reactor fuel does indeed present the problem of control of residual radioactive iodine. However, it is a waste problem which is not an INEL waste problem. INEL processes no irradiated plutonium fuel; further, it is not anticipated, if and when commercial plutonium breeders become operable, that INEL will be processing this fuel. In short, this comment does not apply to the INEL waste management program.

Comment

"' A Summary of Low Radioactive Wastes Buried at Commercial Sites between 1972 and 1973 With Projections to the Year 2000.' It's by O'Connell and Holcomb, and appeared in a Radiation and Data Report, December, 1974. It does, in fact, reach the conclusion that, using current technology, these, all of the commercially operated radioactive waste burial sites, will be full by the year 1998, or some such date."

Response

The subject of commercially operated burial grounds is outside of the scope of waste management operations at INEL and is not applicable to the material treated in the statement in that such wastes are not stored at INEL.

Comment

"Another feeling I have, living in Idaho, is that that aquifer that's underneath the waste management complex needs to be protected at all costs. I do not think that letting the so-called processed wastes percolate down into the aquifer is acceptable to me or to the generation after generation that will follow us, hopefully, in this region. It does not make sense to me.

Apparently it did not make sense to Governor Andrus either. He mentioned that the current Environmental Impact Statement as it stands is totally unacceptable without a commitment to remove the wastes from above the aquifer. I think the reasons for that are obvious. I don't think I need to expand on that except to say that the AEC apparently had promised our Governor Andrus and Senator Church verbally some time ago, 1970 or so, to have these wastes moved out of the INEL by the end of the decade. Andrus has emphasized in the media that he expects that promise to be honored. He's no longer our Governor. What concerns me is the organizational deception involved possibly waiting for this man's term to expire, and then going ahead and doing its thing anyway despite the obvious sub-optimal location above a major aquifer."

Response

The omission from the draft statement of reference to the correspondence and conversations between Governor Andrus, Senator Church, and ERDA officials was certainly not intended as a deception. This subject is addressed in the final statement. Removal of stored wastes from above the Snake River Plain aquifer, however, must certainly await the designation and development of a final disposal site capable of accepting wastes which may be moved. Meanwhile, routine sampling of the aquifer and sampling of the underground formations beneath stored wastes show that there is no near- or medium-term threat to this important water resource, by percolation of surface water downward through wastes, resulting in the movement of radionuclides.

Comment

"They're handling, I believe, more plutonium here than they are anywhere else in the country, and I think that a section on the toxicology health effects of especially this material, but perhaps the most dangerous other materials with which I'm not familiar, should be in the environmental impact statement."

X.0.22 Dennis Donnelly Oral Testimony (Continued)

Response

The amount of plutonium contaminated low-level defense wastes handled at INEL is substantial. The amount of plutonium involved is small compared to that handled in many other programs and locations. The radiation-toxicity of plutonium had been fully taken into account when the standards were set for permitted releases of plutonium to both air and water. Releases at INEL are well below the maximum concentrations permitted and are therefore not considered significantly hazardous to health. The subject of plutonium toxicology and health effects would occupy a whole volume and is not considered to be an appropriate part of a waste management operations statement. The standards for radiation protection and the concentrations of plutonium permitted in air and water both for controlled and uncontrolled areas are found in ERDA Manual, Chapter 0524, Appendix A.

Comment

"To me responsible management of radioactive waste probably would involve a commitment to be able to clean up the whole site to allow unrestricted access, including living and farming if possible future generations might want to do that in that place."

Response

Restoration of land to completely unrestricted uses such as living and farming is a distinct possibility for essentially all of INEL. Unrestricted use, however, would be contingent upon the land being radiologically surveyed and found sufficiently free of radioactive contamination to meet whatever standards of 'cleanliness' may be applied. At present, there are no such federal standards although a standard for acceptable plutonium contamination is currently under development. The state of Colorado has set a very strict standard for acceptable plutonium levels in soil for unrestricted use. All of INEL would qualify under Colorado standards, except a few local spots at the RWMC, as explained in Section III.B.1.

The decontamination and decommissioning of major facilities are discussed in response to comment X.12.7.

Comment

"I claim no expertise in this area. The only comment I would make about this reconcentration problem is with respect to the assurances in this draft statement that the ion exchange process is removing a lot of your dangerous nuclides from the processes wastes as they percolate down into the ground.

I, in digging around, I read an article, treating the remobilization of nuclides that were suspended in soils and sand, and it pointed out that the stuff can be remobilized by detergents or phosphates."

Response

It is true that mobilization could occur, if there were very drastic changes in the chemical environment. It is recognized that over thousands of years, climatic changes, changes in vegetation, and the decay of vegetable material may well affect the acidity and other chemical properties of water which may fall on INEL and may percolate downward in the soil, creating a potential for remobilizing the long-lived nuclides still present (i.e., those that have not decayed to insignificant quantities). Plutonium would be the only nuclide of concern after a few centuries.

It is interesting to note that about a million years ago in Africa a natural nuclear reactor operated in a uranium ore body and that certain of the "ashes" of this reactor, e.g., stable

X.0.22 Dennis Donnelly Oral Testimony (Continued)

Response (Continued)

(nonradioactive) fission products, have remained in place despite many many thousands of years of percolation of surface water through the ore body.

It is very doubtful that phosphate air pollution and the trapping of phosphoric acid in falling precipitation would ever occur in the quantities sufficient to affect the chemistry of any but the first few top centimeters of soil, to the extent that elution of fixed fission products and plutonium would occur.

Comment

"I do not feel satisfied on several areas on the meteorological impact of gaseous wastes in regard to temperature inversions in this region. I do not feel satisfied about the absence of information there. I feel that should be included."

Response

Section II.C.6 of the final statement describes the wind conditions at INEL including inversions. The impact of gaseous wastes is discussed in Section III.B.1. Appendix D provides calculational methods of atmospheric dispersion of INEL effluents. Additional detailed meteorological and climatological data are contained in References 52 through 60.

Comment

"I do not feel satisfied with respect to the handling of the shutdown reactors at the site. I feel that besides mentioning that a program, an active program, is underway, I would like to see its goals and what it's going to do or not do spelled out in an impact statement. To me that's part of the environmental impact of radioactive waste at the Site."

Response

See response to comment X.12.7.

X.0.23 Oral Testimony of David Frey, 620 North Arthur, Apt. #3,  
Pocatello, ID 83201

Comment

"Now, as we know, there are nuclear reactors, there are chemical processing plants, treatment facilities, storage tanks. At Rocky Flats there are such things as plutonium warehouses. There's tooling bins, we have transport equipment that's been exposed to radiation, and of course, yes, we have bombs and nuclear warheads all made of material that will corrode, decay, rust, weather, become useless. But future amounts of these things must somehow be disposed of because these are radioactive and potentially lethal wastes that we never hear about. And they are neglected in ERDA 1536."

Response

The statement does not, as the comment suggests, discuss the disposition of the bulk of fissile materials contained in difused bombs and nuclear warheads. Nearly all of such material is recovered and recycled, but not at INEL. It is only some of the contaminated recovery equipment and the wastes resulting from decontaminating that equipment that are stored at INEL. These wastes are noted in Section II.A.9 of the final statement.

X.O.23 David Frey Oral Testimony (Continued)

Comment

"Talk about solid wastes. Specifically about the INEL site. And according to NBC news and now according to Dr. Hannum, there are approximately 1,000 pounds of plutonium-239 buried here, but contrary to what the Doctor just said, NBC news says that this is more than anywhere else in the United States, and so I don't understand how this is not a major plutonium area."

Response

The statement that 1,000 pounds of plutonium-239 present at INEL "is more than anywhere else in the United States" reflects a misconception. There are many times that amount in weapons and weapons manufacturing facilities around the country. The reference to this being "more than anywhere else in the United States" refers to this particular class of plutonium contaminated low-level defense wastes.

Comment

"I can understand the sanity and the skepticism that is behind the slowdown of a commitment to permanently burying wastes, permanently burying these highly toxic poisons anywhere. Now, INEL is not alone in this dilemma."

Response

There is no slowdown in ERDA's efforts and commitment to identifying and developing permanent disposal sites for plutonium and other kinds of wastes; on the contrary, the effort is being accelerated. It should be noted, however, that INEL is not considered to be a site for a final repository.

Comment

"I didn't realize that some wastes are dumped directly in the water table by deep well method. . . But at any rate, nobody knows where that water even comes out, or how can the effects of this act be measured?"

Response

Section II.C.9 of the final statement describes the hydrology of INEL and explains that the discharge of the groundwater is via springs in the valley of the Snake River 125 mi southwest of INEL. The effects of the disposal of low-level wastes into the aquifer have been determined by drilling numerous wells, and sampling and analyzing the water as noted in numerous places in the statement. This monitoring verifies that waste products in the aquifer are localized and that concentrations of waste products are far below state and federal drinking water standards.

X.O.24 Oral Testimony of Paul Voilleque , 1425 East 16th St.,  
Idaho Falls, ID 83401

NOTE

Several of the key issues raised in Mr. Voilleque's oral testimony are also covered in his formal comment letter. Responses to these comments are found in Section X.II.

Comment

"Both plutonium and iodine-129 have been observed in samples taken from the aquifer down gradient from the ICPP discharge well.

X.0.24 Paul Voilleque' Oral Testimony (Continued)

Comment (Continued)

While the dispersion of iodine-129 and plutonium are not as well defined as those of tritium and strontium-90, further sampling could accomplish such definition. . . .

A conscious decision not to detect those long lived iostopes in the aquifer is also a decision not to learn about the transport of these nuclides in aquifer water and their sorption by the subsurface materials."

Response

Sampling and analysis procedures have been improved to better detect and measure the very small concentrations of iodine-129 and plutonium present. All information gained since 1974 is included in Section III of the final statement.

Comment

"The staff statement indicates that ERDA-1536 will be supplemented to describe pollution control improvements which have occurred at the INEL since the end of 1974.

That document should also be supplemented by inclusion of the liquid waste discharge and environmental monitoring data, obtained both before and since December 1974 for iodine-129 and transuranic nuclides."

Response

Pollution control improvements made since 1974 are discussed in the final statement, as are available data on discharge and environmental monitoring for I-129 and transuranic nuclides. These data are included in Section III and Appendix E of the final statement.

Comment

"I looked again at Section V last night, and it seems to me that those alternatives are not well discussed.

I believe a comment was made earlier today in the same area; that is, there is no -- essentially no cost benefit in the evaluation."

Response

The chapter of alternatives has been extensively rewritten, and account has been taken of this and other comments in revising, and improving the analyses.

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X.0.25 Oral Testimony of Karl Shurtliff, Representative of Governor John Evans of Idaho, Statehouse, Boise, ID 83702

Comment

(Paraphrased for brevity)

Dr. Glenn T. Seaborg in 1970 made a commitment to Senator Frank Church and to the people of this state, that the AEC plans to excavate, process, and ship away such military waste temporarily

X.0.25 Karl Shurtliff Oral Testimony (Continued)

Comment (Continued)

stored at NRTS. . . "we hope to start within the decade." The commitment was recognized by Dr. Dixie Lee Ray. "The schedule of this program recognizes (the) commitment to be ready to start moving waste from the site by the end of the decade," Dr. Ray concluded.

It appears that the statement does not recognize this commitment as a part of the history, or current operation of the site. Nor does that statement indicate that this commitment will be included. I therefore request on behalf of Governor Evans and the people of Idaho. . . . that this commitment be put in writing in the Environmental Impact Statement, ERDA 1536.

Response

A new section (III.B.5.f) has been placed in the final statement discussing the controversy over burial of transuranic wastes at INEL, statements and actions of AEC concerning these wastes, and planning by ERDA concerning their long-term management.

X.0.26 Oral Testimony of Mr. Paul Kiepe, 2141 First Avenue S.,  
Payette, ID 83661

Comment

"Whatever inspired this ridiculous AEC decision (to ship wastes to INEL) with all the unoccupied ground there is adjacent to Rocky Flats nuclear bomb plant where the wastes originated, I have never been able to find out or figure out."

Response

See response to comment X.17.3.

Comment

"Page II-221, within the Radioactive Waste Management Complex, RWMC, as shown on the map at page II-2.

The area I sampled is shown approximately by the isopleths numbered 1, 2, and 3 surrounding the RWMC on the map at page III-39.

The samples I took showed various amounts of alpha radiation, over background, when tested on a university instrument. They showed no gamma radiation at all when tested at the State of Idaho, Department of Health with a Geiger counter of ordinary sensitivity. This I have puzzled about since first seeing a few months ago the map showing cesium concentrations at page III-14 of this statement."

Response

Indications of alpha radiation over and above the background of the instrument can mean either or both of two things: (1) there is natural alpha radioactivity in the soil sample (uranium or thorium) which is very common, or (2) there may be low levels of plutonium or other alpha-emitting contamination.

To clearly determine whether the indicated alpha activity is natural radioactivity or not, requires that the soil sample be subjected to dissolution followed by radiochemical separations. If this is not done, the counting data on the untreated soil sample are likely to be quite meaningless. The absence of gamma radiation as measured on a Geiger counter is not surprising because the levels of cesium concentrations are likely to be very low, as shown in the key

X.0.26 Paul Kipe Oral Testimony (Continued)

Response (Continued)

to the figure cited in the comment. Samples would require very long measurement times when counting a soil sample.

See also the response to comment X.8.5.

Comment

"Page III-103 speaks of the curie amounts of radioactivity in both solid waste disposal and waste storage as 'estimated,' mentioning no dates for the period of use of the estimation method which, evidently, preceded the more rigorous method of accounting described at page II-221."

Response

It should be understood that even today, with more advanced instruments to measure the radiation emanating from waste, it is often necessary for some kinds of waste to calculate the curie content of the waste, particularly when the form of the waste is not amenable to sampling and analysis. The more rigorous methods of accounting, referred to in the comment, provided a uniform system for accounting for waste sent to RWMC from various plants, but the accounting system itself does not improve on the accuracy of estimates which often must be made. The accounting system only "keeps better books" than in the past.

Comment

"Page II-221 speaks of 'plutonium contaminated waste disposed of at INEL Subsurface Disposal Area from 1954 through November 1970 as having produced approximately  $2 \times 10^5$  curies. Plutonium-241 comprised about 87% of this activity,' the statement goes on.

Unrestricted guesses of this sort are bad enough, but use of the curie unit is plainly misleading for buried transuranics."

Response

The curie values for plutonium have been replaced with weight values.

Comment

"Just what techniques were used in the early SDA burials, Senator Church revealed March 6, 1970 when he demanded that, 'A minimum of 2 feet of alluvial soil should be required beneath all buried wastes,' for he had learned that the usual method of burial was to scrape all soil away down to the top of the basalt, then cast the waste materials directly on to the face of the rock."

Response

In the early days of subsurface burial of waste, varying amounts of alluvial soil were allowed to remain at the bottom of burial pits and trenches before waste burial. In a few isolated cases, where there were minor outcroppings of basalt, waste materials were placed directly on the basalt. Since 1970 a minimum of two feet of soil has been required at the bottom of each trench for the purpose of absorbing any waste which may leach out of burial waste by percolating surface water. This is described in Section III.B.5.f.

X.0.26 Paul Kiepe Oral Testimony (Continued)

Comment

"The fact that the basalt at the INEL site usually is badly fissured, Senator Church mentioned. This fact the present statement omits reference to in its geology section at pages II-284 and II-285, but takes it up in a one sentence exposition at page II-296 in a characteristic workout of its general schemata, to deceive by telling, but at the wrong page.

Under Snake River Plain aquifer, page II-296 reads, 'Most of the aquifer permeability occurs along the upper and lower contacts of successive basaltic flows which have large and irregular fractures, fissures, and other voids.'

Response

There is no intent to be deceptive. The final statement notes the fractured nature of the basalt, which is of course important in the potential movement of subsurface waste nuclides.

Comment

"Whether or not all Rocky Flats wastes have been shipped since 1954 in steel drums, the matter that Dr. Hannum was talking about, that is, the so-called military wastes, this statement does not specify.

I'm sure, incidentally, it's not true, because I know some of the wastes were shipped in boxes, and when they get to the boxes in this digging up operation, heavens knows what they're going to find or do. That ought to be addressed."

Response

Not all of Rocky Flats wastes have been shipped in steel drums. Currently, Rocky Flats wastes arrive at INEL in steel drums and in reinforced fiberglass boxes, both of which are designed to remain intact for at least 20 years. Early in the history of Rocky Flats shipments, steel drums, wooden boxes and even a few (~3%) cardboard boxes were used. During 1976 a program of "digging up" wastes buried early in the history of RWMC was initiated. As expected, some of the buried containers were found to have lost their integrity and their contents had spilled out.

By using a double portable building erected over the pit being excavated, and by protecting workers with suits with supplied breathing air, it was possible to disinter and retrieve the buried waste, repackage it in steel barrels, retrieve the contaminated soil and place it in steel barrels and, through the use of filters in the ventilation system of the inner building, prevent airborne contaminated dust from escaping to the atmosphere. As a result of this operation, it has been clearly demonstrated that all the early buried waste from Rocky Flats can be safely retrieved and could be shipped to the ERDA final repository when desired.

Comment

"As to the waste not in sealed containers, page II-216 reads, 'The majority of onsite low level radioactive waste, until 1974, was received at RWMC in boxes sealed with tape.' The boxes were of cardboard construction. They were dumped into a trench; when the trench was full of wastes, a heavy steel weight was dropped by crane on the waste, compacting it to half its volume.

What this means is for the period before 1970 when 'low level' meant, more often than now, containing small amounts of transuranics. The heavy weight trick scattered plutonium oxide particles and probably americium particles hither and yon, infecting both workmen and soil.

X.O.26 Paul Kiepe Oral Testimony (Continued)

Comment (Continued)

Quite likely the heavy weight trick helped to scatter the plutonium and americium across the 5,000 to 6,000 acres of the page III-38 and following Figure III-26 description and map, infecting near workmen more, ones further away, less."

Response

Cardboard boxes compacted by the method described (now no longer used) contained only locally-generated low-level wastes contaminated with fission and activation products. No plutonium/americium wastes were treated in this manner and no significant quantities of those airborne isotopes derived from that compacting method. Workmen involved in those operations wore appropriate breathing equipment and protective clothing and constant air monitors (with alarms) were placed near the working pit to warn of potentially dangerous levels of airborne radioactivity.

Comment

"It is a small wonder, I should say, considering the plutonium scatter map just cited that the statement at page III-104, a wrong page again, preceded by a misleading subtitle on the previous page, 'Land Commitment,' should attempt to say something about atmospheric dust problems.

But if routinely performed, as they say, excavation at the SDA throughout the operational period does not contribute to atmospheric dust problems despite 78 mile per hour wind mentioned at page II-283 and two tornadoes mentioned at page II-283. One wonders how plutonium and americium got so scattered as pages III-38 and III-39 show."

Response

Trivial quantities of plutonium have been scattered by winds during burial operations, although contrary to what the comment implies, no operations are conducted during periods of high winds. The data presented in the map (Figure III-26) page III-39 in the draft have been reevaluated and the map redrawn for increased clarity.

Comment

"Most certainly, these doubts grew a lot stronger when I read the first paragraph of page III-107, stating, 'Radiochemical analyses of samples taken in subsurface sediment beds and groundwater have shown instances of detectable contamination.'

In effect, the condemnation says that the engineers of USGS don't know how to drill a test well without salting themselves in the drilling, nor how to case up a well so contamination from the surface does not continue to produce false readings. This, of course, is ridiculous."

Response

The text in this section has been rewritten because it apparently failed to make clear that the detectable contamination was potentially the result of the (core) samples of the sediment beds becoming contaminated by surface "dirt" either during the drilling operation or after the samples had been brought to the surface. A follow-up study conducted in 1975 and continuing in 1976 and 1977 used more stringent anticontamination measures to better protect core samples from acquiring contamination from surface materials. In these latter studies, core samples from the subsurface beds contained no detectable quantities of radioactive contaminants. This work is more clearly described in a new paragraph inserted at this point.

X.0.26 Paul Kiepe Oral Testimony (Continued)

Comment

". . . . high level wastes from the calcining operations . . . . transferred to, then buried at, RWMC subsurface disposal area."

Response

The citation refers to "high radiation level" wastes. This reference was to certain activated components. Since there is the potential for confusion with "high-level wastes" this terminology has been clarified in the final statement.

Comments

(Paraphrased for brevity)

INEL wastes are very long-lived and have very long-term implications for the health and safety of future generations. The first step of the modern waste management is to stop creating more waste.

Response

The alternatives section addresses the possibility of ceasing to generate more wastes and considers the loss of benefits therefrom as against the costs of safely managing the wastes that are generated.

X.0.27 Comments from the Oral Testimony of A. Kenneth Dunn,  
Idaho Department of Water Resources, Boise, ID 83702

Comment

"I would request that a single listing of liquid disposal facilities be provided in the EIS, that it should include the location, the quantity of discharge received by each facility, and a complete analysis of the radioactive and nonradioactive properties of the waste discharged."

Response

In the final statement liquid disposal facilities and the quality and quantity of disposed liquid have been provided for each individual plant in order that appropriate partial summations can be made for various purposes. For example, in considering hydrological transport of certain materials disposed in the aquifer, it is often useful to consider TRA and ICPP together, but not to include TAN or PBF disposals.

Comment

"Data on all wells . . . . penetrating to the aquifer are not presented in the EIS . . . ."

Response

Data on all wells are presented in the final statement.

Comment

"The Department of Water Resources cannot agree with ERDA that waste wells represent a safe way of disposing of wastes."

X.0.27 A. Kenneth Dunn Oral Testimony (Continued)

Response

Radioactive wastes disposed of via wells meet all present state and federal standards. If the standards change, consideration will be given to alternate methods of disposal. With respect to nonradioactive wastes, former practices of well disposal are being replaced by the use of surface evaporation ponds.

Comment

"The EIS in Appendix B documents some 28 radiation releases in the period 1954 to 1974. Note that no data is presented on nonradioactive releases anywhere in the EIS."

Response

The radioactive releases listed in Appendix B were all unexpected, accidental releases. No substantial unexpected releases of nonradioactive material have occurred.

Comment

"The EPA has proposed regulations which would prohibit the use of waste disposal wells . . . the possibility of building lined ponds is given only brief mention . . . without presenting an estimated cost."

Response

ERDA is currently addressing various alternatives (and costs) to the use of such wells at INEL. These alternatives, including evaporation ponds, are discussed in Section V.

Comment

". . . . 4 milligrams per liter is the maximum concentration of boron that even the most tolerant of crops can withstand. The discharge from the LOFT project . . . . will contain 15 milligrams per liter of boron."

Response

A lined evaporation pond is now planned to dispose of boron waste instead of discharging it via a well at the LOFT facility.

Comment

"Why then is a chromium inhibitor planned for use at the PBF with injection planned to a disposal well?"

Response

A lined evaporation pond planned for PBF will make use of the well unnecessary. This is described in Appendix E.

Comment

"What might happen to wastes stored at INEL if Mackey Dam failed suddenly when full to capacity?"

Response

A current analyses of the impact of failure of the Mackay Dam on INEL is in progress and will be published in 1977.

X.O.27 A. Kenneth Dunn Oral Testimony (Continued)

Comment

"On page II-287, it was noted that buildings designed since 1974 are designed for Seismic Zone III. Were the older facilities reviewed in light of this designation, and if so, what was the result?"

Response

Many INEL facilities have been designed to accommodate earthquakes more severe than those anticipated in Seismic Zone III. Older facilities (especially those handling large amounts of radioactivity) not so designed, have been reviewed and appropriate actions taken, such as strengthening walls, and adding supports to tanks, when technically and economically possible. On the other hand, in cases where it is not feasible to strengthen a facility, damage can be expected. For example a very severe earthquake could be expected to topple the ICPP plant stack, but it is not feasible to correct that weakness. For such cases, qualitative risk judgements are used to ensure that this type of situation is not a major contribution to overall site impacts.

See also response to comment X.17.62, regarding changes in seismic zone classifications.

Comment

"On page II-298, it states that the water table gradient is very flat on INEL near Mud Lake. Could underground flow be redirected off INEL by large scale groundwater pumping projects now proposed near Mud Lake; and if so, what would the result be for domestic wells in the Mud Lake area?"

Response

It is not considered credible that pumping at Mud Lake would be sufficient to reverse aquifer flow direction so that water under INEL would flow eastward. The recharge of the aquifer from the east of Mud Lake is so large that it would accommodate any realistic localized lowering of the water table in the vicinity of a pumping well or wells. The high permeability in this region accentuates rapid refilling of localized depletions.

Comment

"It appears that no monitoring program has been established on a regular basis to determine the fate of nonradioactive contaminants within the Snake Plain aquifer."

Response

The important (major) nonradioactive contaminants that are now, or have been in the past, released to the aquifer (chloride, chromate, etc.) are continuously monitored and their distributions are shown (down to the detection limit) in the appropriate isopleth graphs in Section III. Approximately one-third of the 25 years USGS monitoring study has been devoted to determining the fate of chemical wastes entering the aquifer.

Comment

"The groundwater under INEL is subject to state control and its use must be by appropriation represented by a water right. INEL should apply for a permit to appropriate the water used."

Response

ERDA, previously the AEC, applied for and received the required license and certificate of water right. Water License No. 21253, dated December 2, 1964, was issued to the AEC. The

X.0.27 A. Kenneth Dunn Oral Testimony (Continued)

Response (Continued)

license permits a maximum of 50 ft<sup>3</sup>/sec to be appropriated by pumping from wells at specified points of diversion within INEL. This 50 ft<sup>3</sup>/sec covers all of INEL.

X.0.28 Oral Testimony of Gomer Condit, Idaho Power Company, Boise, ID 83702

Comments in Mr. Condit's testimony did not require changes in the statement.

X.0.29 Oral Testimony of Richard Laufenberg, Boise, ID 83702

The comments and questions of Mr. Laufenberg concern waste storage and publicity concerning the hearings and were responded to orally at the hearings.

X.0.30 Oral Testimony of Scott Harris, Payette, ID 83661

Comment

"I feel that no further production [of nuclear wastes] should occur . . . until some method of decomposing these wastes safely is developed."

Response

The concept of "decomposition" can be taken to mean a separation into characteristic types of wastes, or could be taken to mean some form of processing which renders the waste less toxic. Waste segregation is currently routinely done on the basis of the handling required and the potential toxicity life. The potential advantage of further segregation to simplify processing is reviewed regularly. In addition, studies are underway related to the chemical segregation of transuranic (long-lived) wastes. To reduce the total toxicity could in principle be achieved by returning selected long-lived isotopes to be consumed in a reactor (actinide recycle) or in artificial radiation fields. These alternatives have not been shown to have benefits commensurate with the costs and risks involved.

Comment

"In addition, we must recover all wastes now in the aquifer and the underground water table in order for all people living in Idaho and especially along the Snake River to feel safe."

Response

The recovery of wastes already present in the aquifer is not possible. However, it should be noted that the aquifer itself is self-cleaning in the sense that many radioactive species are absorbed in and on the material (rocks, sediments) in the aquifer zone. Finally, it must be pointed out that no wastes injected into the aquifer are at concentrations exceeding the concentration limits specified in state and federal standards.

NOTE

At the conclusion of the Idaho Falls and Boise hearings, the record was left open for a brief period of time to permit submission of written comments. These comments and responses thereto are found in the following parts of X.0.

X.0.31 Additional Comments From Mr. Paul Kiepe, Payette, ID 83661

Comment

"Concerning the 'recent basalt lava flows,' their most important i.e., their impact - aspect should be stated: e.g., 'These flows are all badly fissured.'"

Response

The basaltic lava flows are described as fissured in the final statement.

Comment

"The location of 'surface faulting' from earthquake of August 1959 should not be omitted."

Response

There was no surface faulting at or near INEL as a result of the August 1959 earthquake.

Comment

"Change 'regional water table' (at next-to-last line) to 'underlying Snake River aquifer.'"

Response

"Regional water table" was used to indicate the top (uppermost) level of the aquifer and the terminology is retained.

Comment

"The statement (under 'B') that 'Certain small areas will require perpetual surveillance . . . . etc.' belongs way back under the waste management discussion. Surveillance is not impact on environments; its impact on people. But in this Statement's sense, it's not impact at all, but a mode of management."

Response

The requirement for perpetual surveillance was noted to indicate merely that certain areas of INEL are dedicated to long-term use in nuclear activities and will preclude their use in farming or grazing activities.

Comment

"The entire Statement's notion that only radionuclides with 'a half-life longer than 10 years' need be considered in an environmental impact problem 'irreversible and irretrievable,' as says the title to this subsection ('H'), blandly ignores the relevant section of the National Environmental Protection Act (NEPA). This is Section 4331, which refers, at subsection (b) (1), to ' . . . the responsibilities of each generation as trustee of the environment for succeeding generations.' This provision of NEPA brings under consideration, not the half-life of a radioactive nuclide, but its danger life.

Generally, the danger life is taken to be at least 18 times the half-life, or more. At page III-107, concerning cobalt-60 (half-life 5.3 years), it is said that 'The activity in this waste will be reduced to insignificance in about 100 years.' So the multiplier is about 18.

In the case of 10-year half-life, the danger-life becomes 180 years.

Using the customary figure for 'each generation' to be about 30 years, a 10-year half-life gets us up to a danger-life of more than 14 generations: clearly an impact problem which must be addressed.

X.O.31 Paul Kiepe Additional Testimony (Continued)

Comment (Continued)

Any nuclide of more than 1.7-year half-life presents a problem of more than one generation's impact."

Response

All of the very long-lived (Pu) wastes are under control and are safely retained in storage, awaiting shipment to a final federal repository. Other wastes of intermediate or short half-lives are also under control even though they may survive through several generations. Their trustee-ship, however, will pass on to a few future generations, with the expectation that future generations will act as responsibly as the present, in ensuring that these latter kinds of waste do not get out of control before they have decayed to nonsignificant levels.

Comment

"The LOFT project is the responsibility of the Nuclear Regulatory Commission (NRC). Its complex and potentially dangerous impact should be treated by NRC in a separate statement replacing WASH-1517, to which the present Statement makes no reference."

Response

Although the LOFT program is funded by NRC, the work is actually being carried out by ERDA and ERDA-contractor personnel. The final statement references the environmental statement for LOFT in Section II.A.5. It is Reference 40 in the final statement.

Comment

"This map or the previous one (page II-3) should show the distance to all-important aquifer subterranean to INEL where it meets the Snake River at Hagerman, Idaho."

Response

In the final statement a new figure (Figure II-1) has been included to show the distance to the Snake River near Hagerman, Idaho.

Comment

"Here we read the EBR-II holds a load of 90,000 gallons of molten sodium for power of 20 MW. Later on (page II-257), the power of EBR-I, now shut down, is given as 1 MW. Hence when dismantled, EBR-I must have had as waste about 4,500 gallons of radioactive sodium. But disposal thereof this Statement makes no mention."

Response

This omission is corrected by an added paragraph in Section II.A.12.e, providing the appropriate information. The EBR-I coolant was actually a mixture of sodium and potassium metals and in 1974 was disposed of by reacting the sodium-potassium with water, evaporating the solution to dryness in a tank, and burying the tank at the RWMC.

Comment

"Probable life of '2,500-gallons carbon steel retention tank . . . and hardware' under ambient conditions should be given."

X.O.31 Paul Kiepe Additional Testimony (Continued)

Response

Use of this carbon steel retention tank was discontinued in 1975 so its probable life now has no significant relationship to waste management programs.

Comment

"The absence of iodine isotopes along with nontabular tabulation (why?) of EBR-II effluents seems inconsistent, not only with proper form but with common knowledge. 368 Ci of Xenon-133, and 147 Ci of Xenon-147, and no iodine. I don't believe it."

Response

The absence of significant quantities of iodine in EBR-II off-gases is explained by the high affinity of the sodium coolant for iodine. The radioactive iodine nuclides remain dissolved (trapped) in the coolant sodium metal until they decay to xenon nuclides. The latter are not effectively retained in the liquid sodium and hence appear in the off-gases.

Comment

"The ICPP processes highly enriched irradiated nuclear reactor fuel elements' differs materially from the description at page II-4, which says, 'The ICPP recovers uranium from a variety of spent reactor fuels.' What are the facts? Is ICPP dealing only with the highly enriched fuels used by Navy and Army, or is the facility dealing also with fuels of low enrichment characteristic of reactors used commercially? Why not tabulate the fuels processed as to type, amounts, and type of wastes. What Idaho wants to know is, are commercial fuels being brought in and treated secretly, after withdrawal of WASH-1539.

The way this page mixes up the matter of fuel storage and fuel processing, the reader doesn't know where he is.

Is such the effect the writers intended? If so, it's mighty sneaky business in an impact statement, as my testimony pages 4-21, I hope, sets forth in plain enough detail."

Response

ICPP processes only highly enriched fuel from noncommercial sources. Although all fuel processed is highly enriched, the dimensions, cladding, burnup, and other properties of fuel vary widely. Some fuel has zircaloy cladding, some aluminum cladding, some stainless steel cladding, etc. Some fuel elements are plate type, others rod type, etc., so there is a variety of spent fuels, but all from ERDA or military reactors. There is no commercial LWR fuel being processed. The only fuel from commercial type reactors relates to reactor projects funded as demonstration projects and currently includes Peach Bottom I and will include the Ft. St. Vrain fuel.

Comment

"This tabulation of 1974 ICPP releases one question, especially when compared to EPA-74 page 18. Why should the ANLW air releases be so different with respect to the xenons? And no iodine in either. Certainly explanation ought to appear."

Response

The tabulations give the true composition of airborne releases. There are several factors which make the ANL-W and ICPP releases different. The ICPP gaseous releases are mainly from the dissolving of fuel that has been out of a reactor and decayed for a minimum of 120 days (often much longer). Short-lived nuclides have therefore disappeared. ANL-EBR-II releases

X.0.31 Paul Kiepe Additional Testimony (Continued)

Response (Continued)

are from an operating reactor where fission gases that may have escaped from fuel or test specimens are relatively young, and have not had much time to decay before release. Iodine is not released at EBR-II because it remains dissolved in the sodium coolant.

Comment

"Are the ends of the stainless steel filters closed (with such steel? or some other substance?) when buried?"

Response

The ends of the stainless steel filters are not closed with steel caps prior to burial. The radioactive contaminants on the filters are fission products of moderate half-lives and can be buried, as other similar waste is buried, without posing a long-term threat to the environment.

Comment

"This Figure (II-29) ought to be supplemented by an account of the method of estimation."

Response

The volumes of nonradioactive wastes are estimated only because a more exact number for cubic yards of waste paper, packaging materials, garbage, etc., is not needed. The estimates are based on the capacities of containers used to transport this waste to the landfill, times the number of containers shipped per month.

Comment

"Effluents from ATR would seem to be zero, judging from the description. Yet the test reactor is described as 'the world's largest.' What happens to its fuel rods? Have the same ones been in use since July 1967, or are one-third removed yearly, as is usual with commercial rods? Presuming the reactor to have much down time, what about the problem of contaminated water, if boron is added to the primary-cycle coolant water. What about the burnup of control rods during long periods of nonuse of the reactor? What happens to these rods?"

A non-waste-producing 250-MW reactor seems incredible. Hence the reader is bound to suspect cover-up of some extraordinary impact the Statement's authors wish covered up."

Response

The airborne wastes from ATR are described in Section II.A.7.b of the final statement. Liquid waste effluents from TRA reactors use a common discharge system and are described in Section II.A.7.d. Solid wastes and waste systems for ATR are found in Section II.A.7.f. Spent fuel rods are sent to ICPP for recovery of unburned uranium. Control rods are sent to the RWMC for disposal.

Comment

"Does Figure II-40 here summarize measured TRA releases or approximate releases -- back to 1952. If measured, how measured?"

Response

A description of the sampling equipment which measures TRA releases has been added to the text, Section II.A.7.b. Also, the (lower) detection limits of this equipment are given.

X.0.31 Paul Kiepe Additional Testimony (Continued)

Comment

"Prior INEL releases have shown many more features of RWMC. Why does Figure II-46 have most features masked out? The Figure shows TDA, for example. But where is SDA? Etc."

Response

In response to several similar comments a new figure showing all RWMC features has been added in the final statement.

Comment

"It is these descriptions we find so confusing. What in the world is the subsection 'Independent Reviewing Groups' doing within the pages describing Waste Data, SL-1 Burial Grounds, etc.???"

Response

This material has been moved to the discussion of the environmental monitoring program, II.C.12.

X.0.32 Additional Comments Received from Energy Research Group, Inc.  
After the Close of Hearings

Comment

"Define 'very high integrity' of naval fuel."

Response

Description of the naval fuel is classified and cannot be given in the statement. Suffice it to say that this fuel is a type that can meet high performance standards.

Comment

"What about small wildlife?"

Response

Small wildlife has not received the attention that antelope have at INEL but with an increasing emphasis on environmental effects of waste management practices, greater emphasis is being placed on small wildlife in the future. Wild antelope, however, have the largest thyroids and are most suitable for thyroid analysis for I-129.

Comment

"Identify '40 different reactors' including locations. This number seems rather small. Identify the current breakdown of inventory and present and future commitments from all reactors."

Response

All reactors that have now or have had in the past, significant impacts, have been listed and their contributions to wastes given. Many of the now disused reactors were low-power critical facilities, housed in laboratory buildings. They had no significant impact on the waste problem and therefore have not been discussed.

X.0.32 Energy Research Group Additional Testimony (Continued)

Comment

"Burning wastes contaminated at 1.5  $\mu\text{g}/\text{l}$  plutonium content seems high. It is not adequate to justify such releases by comparing them to higher releases from other sources at the plant, particularly when the sources are given for four random months in 1970 without any evaluation of the representative nature of the releases and the data is given in meaningless units."

Response

The solvent waste burner effluents are routed to and monitored at the ICPP stack. The solvent waste burner effluents, therefore, are included in total stack effluent. This is clarified in the final statement in Section II.A.3.c.

Comment

"The accident assessment on calcine bins as 'might possibly shear' and 'should not occur' is inadequate. This is representative of the general inadequacy of accident assessment. What about tornado underpressure sucking material out of bins?"

Response

The ability of the calcine storage bins to withstand the design basis earthquake with a maximum ground acceleration of 0.33 g is the subject of a mechanical engineering analysis[a] which should be consulted for the details requested in the comment.

The possibility of an atmospheric underpressure transient caused by a passing tornado and resulting in calcined granules being sucked out of the bins is considered incredible. The calcine bins are connected via long vent pipes to the ICPP stack. The effect of an underpressure transient over such a long run of pipe would be severely damped by the time the pressure transient had proceeded down through the stack thru the blowers, and to the bins. Furthermore, there is not a great deal of air-filled void space in the bins to serve as a driving force to move calcine out of the bins. But even if the granules ever were to be sucked out, they would have a very long run to make before escaping containment in the piping and the stack itself. For these reasons the suggested effect is considered incredible.

Comment

"No adequate assessment of the decommissioning of facilities."

Response

For each facility undergoing decommissioning a complete safety analysis is required. For example, one was required for decontamination and decommissioning of EBR-I, the only major facility which has been completely decommissioned. These will be developed as retired facilities are prepared for decommissioning; ERDA-ID's decontamination and decommissioning plan is given in Section II.A.13.

Comment

"Characterization of indigenous wildlife is totally inadequate. The report must provide a comprehensive assessment of species, counts, locations, movements, etc., with particular attention to small wildlife, burrowing animals, reptiles and others which could become exposed to wastes and enter other phases of the food chain."

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[a] "Safety Analysis Report for the ICPP High-Level Solid Radioactive Waste Storage Facilities," G. Lohse, Document ICP-1005 (January 1972).

X.O.32 Energy Research Group Additional Testimony (Continued)

Response

A more complete characterization of indigenous wildlife at INEL is presently being developed in cooperation with nearby colleges and universities. These data will be published as they become available.

Comment

"Increase from 4800 Ci to 260,000 Ci from 1973 to 1974 is unexplained except as an 'increase in reprocessing activity.' No explanation is provided as to whether such reprocessing activity is abnormal or will continue into the future."

Response

This increase is explained in Section II.A.3.a. of the final statement.

Comment

"Activity levels around several facilities are very high for unfenced areas (e.g., page III-31, Health Services Lab. 300 mr/hr)."

Response

The values shown are in micro r/hour, not milli r/hour.

Comment

"What is current status and near-term commitments of TSA?"

Response

These commitments are discussed in Section III.B.5.f of the final statement.

Comment

"Abnormal conditions assessments are lacking in quantification. Cooling systems to high-level waste tanks are not adequately described and the likelihood and impact of loss of tank cooling is not analyzed. Accountability procedures to ensure no future losses of wastes through small leaks in transfer pipes are not identified."

Response

Loss of cooling for the high-level waste tanks is addressed in Section III.C.3 of the final statement.

The problem of detecting losses of liquid wastes through small leaks in transfer lines is better solved by detecting small accumulations of leaking liquids in the secondary pipe-sump systems rather than by observing small (accounting) differences between two large volume measurements. In this connection, the current ICP liquid waste system upgrade program is installing alarms in the leak-detection sump system to call immediate attention to leaking transfer pipes. Formerly, each sump had to be sampled on a periodic schedule. This improvement is explained in Appendix E of the final statement.

Comment

"Consideration should be given to accidental criticality in reprocessing."

X.0.32 Energy Research Group Additional Testimony (Continued)

Response

Accidental criticality consideration is given to every equipment change and flow sheet change made during fuel processing. A review board passes on each change made. No criticality situations are expected and no environmental impact is expected therefrom. However as noted in Appendix C, two self-terminating criticality accidents have occurred at ICPP during processing. It is not possible to state that another accident will never occur, despite required criticality reviews. Equipment malfunctions do sometimes occur, such as plugging of lines, etc., which may lead to unexpected situations. It is noteworthy however that no criticality has occurred since 1961, reflecting a heightened awareness of potential criticality accidents. Whether, if an accident were to occur, its magnitude would exceed that of the former two accidents is difficult to assess.

Comment

"Tornado impact 'analysis' is inadequate. What are the distributions of radionuclides that could occur? What are cleanup costs? Plutonium concentration in Rocky Flats drums is not given."

Response

The spread of contamination from tornado effects is limited to materials which are in the process of being placed in storage. The barrels and boxes that have already been emplaced in TSA and covered over with earth would not be significantly disturbed by a tornado passing over the surface of the completed storage area. Only those few barrels and boxes being stacked might be involved. There is insufficient knowledge concerning the size and location of the area over which radionuclides might be spread to assess the magnitude of the potential contamination area or the costs of cleanup.

The maximum amount of plutonium permitted in a single steel drum of Rocky Flats waste for TSA storage is 200 grams. However the average drum contains only 2.1 grams, some only a few milligrams.

Comment

"The integrity criteria for INEL shipping casks are not identified."

Response

The integrity criteria for INEL shipping casks are given in ERDA Document IDM-0529.

Comment

"Is the basic philosophy of current INEL waste management operations perpetual surveillance, ultimate disposal, or a combination of the two?"

Response

The basic philosophy of current INEL waste management operations is two-fold:

- (a) For short-to-medium half-life waste nuclides such as activation products and fission products incorporated in wastes buried in trenches and pits, the basic philosophy is that those materials are permanently disposed of and there is no intent to disinter them. Surveillance will continue until the radioactivity has essentially decayed away, to be sure that no significant quantities escape to the environment.

X.O.32 Energy Research Group Additional Testimony (Continued)

Response (Continued)

- (b) For very long-lived waste nuclide wastes such as transuranics (Pu, Am), the basic philosophy is that those materials are being held in interim storage awaiting transport from INEL to the final federal repository when it is ready to receive them. These wastes too are kept under surveillance to be sure that no significant quantities escape to the environment.

Comment

"Alternatives are frequently listed without substantive analysis and more critically without recommendations as to the preferable alternative and future program criteria and actions. In terms of alternatives for the overall waste management programs, consideration of less extreme alternatives would be more plausible, e.g., temporary suspension or improvement of ICPP operations rather than total shutdown. New facilities could be built elsewhere without cessation of current INEL programs, e.g., relocation of additional reprocessing and solidification facilities so as to minimize transportation distance."

Response

The entire section on alternatives has been rewritten in response to this and other comments and includes more substantive analyses and recommendations for preferred alternatives.

Comment

"The DEIS fails to mention whether gas delay systems or gas collection and storage systems should or will be installed. This is typical of much of the alternatives discussion."

Response

The statement notes that gas collection and storage systems can be installed. Whether they should be or will be installed depends upon whether gas releases meet present or will meet future standards. It should be recognized that this environmental statement is a base document upon which ERDA officials can plot future courses and make future policy decisions. Recommendations can be made in the statement but the making of decisions to adopt them is not a part of the present effort.

Comment

"Criteria for waste categorization and classification are not discussed."

Response

See response to comment X.20.5.

Comment

"The alternative of waste vitrification is discussed only in cursory manner and no conclusions are drawn. The feasibility and advantages of vitrification rather than calcination for the new waste solidification facility are not addressed."

Response

The decision to continue with calcination of ICPP wastes was made on the basis of a number of considerations: (a) the ICPP wastes are most amenable to calcination: (b) there is a >15 year

X.O.32 Energy Research Group Additional Testimony (Continued)

Response (Continued)

wealth of experience in operation of the fluid bed calcination process; (c) the volume reduction achieved is superior to the volume reduction achieved in vitrification; (d) the calcined wastes are easily retrievable from storage for later shipment to a final repository; (e) if for any reason vitrification or incorporation in another matrix is desirable, the calcined waste is amenable to such further treatment. The alternatives of managing these wastes are being studied and a technical alternative document on this subject will be published in 1977. This is referenced in Section V of the final statement.

Comment

"The impact of projected future programs, including anticipated future fuel processing and waste disposal volumes, is not addressed in this Section."

Response

This section of the statement addresses irreversible and irretrievable commitments that have been made up to the present and which can be extrapolated, where appropriate, into the future, assuming programs do not change. However, since INEL is a development-laboratory, programs can be expected to change as one program is completed and another started. No major changes are foreseen for several years in the future, and the irreversible and irretrievable commitments can be expected to remain in their present proportions for that period of time.

Comment

"The DEIS cost-benefit analysis does not consider impacts external to INEL in transportation of spent fuel to the site."

Response

No consideration is given to the impact external to INEL in transporting fuel to the site since fuel is technically not a waste material; however, these impacts have been addressed in other documents -- see Section X.17.1.

COMMENTS ON THE DEIS RECEIVED IN LETTERS

X.1 COMMENT LETTER, National Science Foundation, Washington, D. C. 10550

This letter did not require any change in the statement.

X.2 COMMENT LETTER (2), Department of Health, Education and Welfare, Washington, D. C. 20201

X.2.1 Comment

"There is no discussion, however, regarding occupational health considerations for employees located within specific buildings discussed, or those working in areas out-of-doors but internal to the overall facility complex.

Some of the employee personnel considerations may be included in appropriate occupational safety and health regulations of the Nuclear Regulatory Commission and the Energy Research and Development Administration. However, no information or data is presented in this document that addresses this issue or provides information on enforcement or operational safety to protect those workers in the immediate work environment.

## X.2 COMMENT LETTER (Continued)

### X.2.1 Comment (Continued)

It is apparent that there are many potentially hazardous radiation exposure situations in waste management operations and I feel it is important to provide some discussion to include considerations for personnel protection, work practice criteria, medical surveillance programs, etc."

#### Response

Although occupational safety and radiation protection are important considerations in all operations in INEL, those topics are deemed to lie outside of the scope of this Environmental Impact Statement and were not included. For information it should be noted that there is an extensive onsite personnel monitoring program at INEL. All personnel wear radiation monitoring devices when they enter onsite nuclear facilities. These "dosimeters" are routinely processed and radiation records are available from computerized files. There are also fixed radiation instruments throughout the various facilities and each plant has a staff of health physicists who provide routine radiation monitoring services for personnel protection. Workers who are employed in zones where radiation may be encountered have been trained to do their jobs safely and to avoid as much radiation as possible. Appropriate shielding materials and administrative controls are utilized when applicable. INEL contractors have adopted the "As Low as Practicable" philosophy as related to radiation exposures. Attempts are made to ensure that personnel exposures remain as far below the ERDA occupational exposure guides (3 rem per quarter and 5 rem per year) as practicable. Only in isolated instances are the guideline values ever exceeded. In addition, there is an aggressive general occupational safety program and an extensive medical program involving ERDA and its site contractors. Routine medical examinations and emergency services are provided. A whole-body counter laboratory provides an ongoing service to evaluate any internal radiation exposures.

There are numerous ongoing activities at INEL, not directly related to waste management itself, such as engineering studies, reactor operations, hot cell examination, etc. In these activities, employees may also be exposed to radiation. It is of interest to note that exposures from waste management activities are only a small fraction of the exposures involved with other activities. A summary of total radiation doses experienced is available from ERDA's Division of Safety Standards and Compliance which annually publishes data from each ERDA site.

### X.2.2 Comment

"The treatment of the leak mentioned in III-131 seems inadequate in light of the detail with which activities of less potentially hazardous radiation sources are dealt. This inconsistency may stem from the date of the leak (September 1975) which is outside the purported scope of the statement. Perhaps this subject could be dealt with in more depth in the final environmental impact statement."

#### Response

This leak is treated in Appendix C in about the same detail as other INEL releases, however, some additional clarifying information may be useful.

The leak in question was investigated very extensively and an internal report written. The details of the report are summarized in Appendix C of the statement. No contamination of the aquifer resulted from the leak. Monitoring pipes were driven through the contaminated soil zone and radiation detection probes inserted to delineate the extent of the contaminated soil volume. The entire quantity of solution that had leaked, had been contained and was fixed in the sedimentary material overlying the bedrock. The deepest penetration of liquid was about 25 feet while bedrock lies 50 feet below the surface. The monitoring pipes have been left in place and monitoring is continuing to determine whether any leaching or movement

X.2 COMMENT LETTER (Continued)

Response (Continued)

of the radioactive waste is occurring. Monitoring is done on a quarterly basis. No movement of radioactive waste has been observed.

Additional information is included in Section II.A.3. concerning corrective measures taken to ensure that similar leaks will not occur in the future. The carbon steel line referred to in the original description of the leak, was not a waste line. The connection of that carbon steel line to an encased stainless steel waste line, with only a single valve to prevent radioactive waste solution from entering the carbon steel line, was the result of a design deficiency.

As part of a project to improve the waste tank area and its associated piping, a complete review of all piping has been conducted. One additional carbon steel line, connecting through a single valve to a waste line, was discovered and has now been disconnected. As a result of that review and action, it is not thought possible for similar leakage accidents to occur in the future. It should be noted that all waste lines are encased in secondary (larger) lines to contain any liquids which might leak from the primary waste lines. The secondary lines leak to monitoring sumps for detection of leakage from the primary (waste) lines. This information is included in Section II.A.3 in the final statement.

X.3 COMMENT LETTER, U. S. Department of Agriculture,  
Soil Conservation Service, 304 N. 8th St.,  
Boise, ID 83702

This letter did not require any changes in the statement.

X.4 COMMENT LETTER, U. S. Department of Transportation,  
Material Transportation Bureau,  
Washington, D. C. 20590

This letter did not require any changes in the statement.

X.5 COMMENT LETTER, U. S. Department of Agriculture,  
Agricultural Research Service,  
Washington, D. C. 20250

This letter did not require any changes in the statement.

X.6 COMMENT LETTER, Western Interstate Nuclear Board  
P.O. Box 15038, Lakewood, CO 80215

This letter did not require any changes in the statement.

X.7 COMMENT LETTER, U. S. Department of Transportation,  
Region 10 Representative,  
3112 Federal Building, 915 Second Avenue,  
Seattle, WA 98174

X.7.1 Comment

"This draft EIS primarily addresses onsite matters; however, page II-70 indicates that waste material is received from reactors in numerous locations, including foreign locations. The text addresses a figure of about forty (40) as sources for waste material. In order that responsibility for transportation safety may be properly determined and requirements addressed; the EIS should identify (1) points of origin; (2) transportation mode and route to INEL; (3) any points of transfer, storage, or handling enroute; (4) quantities involved and the scheduling of transportation; (5) form of material involved, liquid, solid, etc."

X.7 COMMENT LETTER (Continued)

Response

See the response to Comment X.17.1.

X.7.2 Comment

"A question arises from review of the current Master Management Program (page I-4) relative to the expected volume of waste material received at INEL. Discussion appears to indicate the present volume of received waste material will remain constant for the foreseeable future. Programs and projects planned or under construction within the nation's fixed nuclear programs, or developments, like the U. S. Navy Trident Project in Puget Sound, would appear to represent a growth factor. Volumes, physical state, point of origin, modes of transportation, probable routes, etc., should be addressed in relationship to the growth potential present."

Response

This comment reflects concern that future offsite nuclear programs may result in increased quantities of "waste" being received at INEL, with increased safety problems attendant to transporting such "waste." Irradiated (spent) fuels shipped from offsite to INEL are not considered waste and their possible transportation impacts are not deemed to lie within the scope of this statement. It should be noted that, if in the future, any programs or projects that are undertaken at INEL which result in generation of larger quantities of waste, separate environmental impact assessments will be required of each such program or project. At present, however, no programs or projects are foreseen which will result in any large net increments in annual waste generation at INEL. These projections for the near future are summarized in the Foreword of this statement.

X.7.3 Comment

"Fire, chemical explosions, or nuclear criticality are discussed (page III-136, 137); however, this discussion does not address material being transported to INEL either under control of ERDA as discussed (page II-67) or under any other control. The text alludes to accountability and record requirements (page III-137) of some agency, presumably ERDA, preventing the accumulation of a critical mass. Waste material being transported or prepared for transportation are subject to hazardous materials regulations published in 49 CFR, 170-179 (see enclosure); additionally, if navigable waters are associated with such transport, Coast Guard regulations now published in 46 CFR, 146, covering Dangerous Cargoes may apply. Transportation of hazardous materials are covered in the Department of Transportation Hazardous Materials regulations in the Federal Register dated Monday, September 20, 1976 (Book 1 of 2 Books). The association of transported material to all of the above regulations should be addressed; likewise, the authority, implementation, and procedures referenced within the text regarding nuclear mass should be elaborated upon."

Response

See the response to comment X.17.1.

X.8 COMMENT LETTER, Paul Kiepe, 2141 First Avenue S, Payette, ID 83661

X.8.1 Comment

"The 'Summary' at this page (III-111) I find unsatisfactory in its reference to an 'indefinite commitment of 158 acres of desert grazing land . . . .' In the first place, the spread of transuranics as suggested by Figure III-26 'Concentrations of plutonium in soil around INEL facilities (III-39)' suggests the 'indefinite commitment' is more like 5,000 to 6,000 acres with the NE portion of the RWMC segment implinging upon Idaho State highways designated U. S. 20 and U. S. 26 [See Figure II-2 'INEL Facilities locations' (II.5)]."

#### X.8 COMMENT LETTER (Continued)

##### Response

The suggestion that 5,000 to 6,000 acres have been indefinitely committed because of plutonium-239 contamination is a misconception. The general levels of measurable contamination will not require restrictions on the possible future uses of more than about 150 acres of land, if any. The most restrictive standard for plutonium contamination of soil was developed by the Colorado Department of Health in 1973. The same department reviewed the standard in 1976[a] and concluded that the standard was ultraconservative. Although ERDA has not adopted this standard, a comparison of concentrations of plutonium-239 at the INEL site to the Colorado standards is helpful. The soil concentrations of plutonium-239 at INEL exceed the Colorado standard in only one area (approximately 130 acres) near the RWMC. Average concentrations in this area are 30 nCi/m<sup>2</sup> or three times the ultraconservative Colorado standard. Some localized contamination in excess of 30 nCi/m<sup>2</sup> has been detected in a drainage channel at the perimeter of the RWMC, but the amount of land impacted is estimated to be less than 2 acres. To avoid further misunderstandings, the figure and accompanying text in this portion of Section III.B.1. are refined in the final statement.

##### X.8.2 Comment

(Paraphrased)

Will ERDA honor the commitment that when a Federal Repository becomes available, accumulated transuranic wastes at the INEL will be transferred to it?

##### Response

This subject is discussed in Section II.B.5.f of the final statement.

##### X.8.3 Comment

"I visited the first of the air-lock buildings (II-221) with a local (Boise) medical doctor. We found the exit surveillance of visitors and employees, by Geiger counter, ridiculous (for alpha emitters) and the workmen moving about within the area without masks, an invitation to disaster--if not right now, then just as soon as the more rusted-out barrels are reached. (The operations of retrieval described at II-221 commenced with the debris buried most recently)."

##### Response

The exit surveillance of visitors and employees from the three air-support buildings is performed not with a Geiger counter but with a RM-14 radiation monitoring instrument, which monitors for alpha, beta, and gamma radiation.

In the initial drum retrieval (IDR) building, a respirator is used by all operators during retrieval operations. After a Health Physics survey of the drums indicates negative radioactive contamination (or when retrieval operations are not being performed) respirators are available but are not always used. In addition, continuous air monitoring is done for beta and gamma radiation, and six air monitors are in operation during retrieval periods; two are alpha monitors, two are beta-gamma monitors, and two are low-volume air samplers. If air contamination is detected, the instruments alarm and alert the employees to hazardous conditions and the need for use of their respirators.

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[a] A Risk Evaluation for the Colorado Plutonium-In-Soil Standard, Colorado Department of Health, January 1976.

#### X.8 COMMENT LETTER (Continued)

##### Response (Continued)

As operations proceed into the rusted-out, older barrels, a third air-support building, EWR (Early Waste Retrieval) is being utilized which has within it a second smaller containment building. This inner building is equipped with HEPA filters, and operators within it work in bubble suits with supplied breathing air. Potential spread of radioactive material and inhalation of alpha-emitting radionuclides are prevented by the precautions noted above.

##### X.8.4 Comment

"When, at III-108, the statement says, 'Some small rodent-type animals could borrow down to the buried wastes and ingest or spread contamination to the surface,' I know this to be an area of outright deception in the draft. As long as three years ago one of the NRTS waste managers referred in Idaho newspaper interviews to the known activities of rodents in spreading the wastes. So how is it now the draft ES speaks of 'could'?"

##### Response

"Could" is considered correct terminology based upon continuing radioecology studies around this Radioactive Waste Management Complex. Recent data[a] indicate the radioactive contamination on the surface immediately outside the waste facility perimeter results from wind and water action. Low levels of plutonium and americium have been noted in drainage channels adjacent to the area, resulting from localized runoff from melting snow and rain.

This same report states that little plutonium and americium have been detected in small mammals burrowing in the soil and that radioactivity in deer mice is below detectable limits except for some mice sampled on the perimeter of the disposal area. Therefore, 'could' is considered the appropriate word to use in this situation.

##### X.8.5 Comment

"I purposely gathered a soil sample from a gopher mound taken about 400 yards north of the burial ground fence. The sample still read in alpha as high as the highest sample reading of these taken within the fenced area not 50 feet from an open trench."

##### Response

It is difficult to respond to this comment without additional information concerning the radiochemical analytical techniques employed, the type of counting instruments used, the efficiency of the counting instruments, the statistical significance of the sample relative to background, etc? The ERDA staff would be happy to have these data to compare with our own findings that the general plutonium contamination in the proximity of the RWMC is near background levels.

##### X.8.6 Comment

"The following statement is simply not true. 'There are no nearby nuclear facilities which contribute to the environmental radioactivity levels around INEL, so the INEL facilities represent the only industrial sources of man-made radioactivity to which the local environment and its inhabitants are exposed.'"

##### Response

The phosphate rock smelting facilities in southeastern Idaho are not nuclear facilities but are industrial facilities releasing natural radioactivity. The radioactive polonium released

[a] 1975 Progress Report, Idaho National Engineering Laboratory, Site Radioecology - Ecology Programs, IDO-12080 (June 1976).

X.8 COMMENT LETTER (Continued)

Response (Continued)

during phosphate operations results from naturally occurring polonium present in the rock before smelting. It is one example of many radioactive isotopes often found in certain geologic formations and soils in areas throughout the world; for example, thorium and radium in some coals, uranium and radium in many sandstones and potassium-40 in granitic rocks. These naturally occurring radioactive materials are part of the "existing natural radioactivity" upon which INEL manmade releases are superimposed, as implied in Section III.A.

X.8.7 Comment

"My suggestion is to hire some experts from one of the scientific groups ordinarily opposed to nuclear reactor proliferation, such as the Union of Concerned Scientists, to go over, not only the ES, but also its data and the persons and instruments used for data accumulation."

Response

The preparation of the Draft Environmental Statement was announced in the Federal Register on August 14, 1973 soliciting comments and suggestions from interested organizations and persons. All comments received were carefully considered in preparation of the document. Public comments were also solicited upon completion of the draft (41 FR27779, July 6, 1976). In addition, public hearings were held in Idaho Falls, and Boise, Idaho on February 1 and February 3, 1977, respectively, to permit further criticism of the draft and to clarify material in it.

X.9 COMMENT LETTER, Public Service Company of Colorado,  
P.O. Box 840, Denver, CO 80201

Comment

(Paraphrased)

The proposed INEL interim storage of spent fuel elements from the Ft. St. Vrain reactor was omitted from the Draft Statement.

Response

In Section II.A.3 of the final statement, reference is made to a facility to handle HTGR fuel and an environmental statement for that facility is referenced (WASH-1534). In that statement, the Ft. St. Vrain fuel storage and processing are noted.

X.10 COMMENT LETTER, U. S. Department of Commerce,  
National Oceanic and Atmospheric Administration  
Washington, D. C. 20230

Comment

"No wind data are presented in the environmental statement. Since dispersion of gaseous effluents is of some concern, climatological information on wind direction and speed would be helpful in determining the direction effluents would travel. Wind data for 1974 were used in the calculational model used to develop radiological doses in the text, but the reader does not know how the concentration may vary in a given season, month, or smaller time frame. A tabular presentation of monthly winds would aid this assessment. Also, the calculated concentrations assume release from a 250-ft chimney. At what height were the wind data taken? The model uses boundary layer winds, but there is little information on how these were derived. A brief explanation would be helpful."

X.10 COMMENT LETTER (Continued)

Response

A discussion on winds at INEL is presented in Section II.C.6 of the final statement. Additional detailed meteorological and climatological data are contained in References 52 through 60 of the statement; these references are on file in the public document room in Washington, D. C. at 20 Massachusetts Avenue, N.W. and elsewhere as noted in the Foreword of the statement.

Calculational methods using wind data and radiological release data are described in Appendix D. The calculated isopleths, shown in Figure D-1, result from hour to hour adjustments due to stability category changes. These are computer calculations. The data points are numerous and are therefore not included in the text. Attention is invited to Reference D-1 of Appendix D which describes the technique used in obtaining annual time integrated air concentrations.

X.11 COMMENT LETTER, Paul G. Voilleque, 1425 East 16th St.,  
Idaho Falls, ID 83401

X.11.1 Comment

"Why doesn't the Summary, which everyone will read, accurately reflect the information presented in Section III. In Table I-I only the 1.3 mrem (not 'mRem') dose from radioactive gases is compared with doses from natural and other man-made sources."

Response

Table I-2, summarizing maximum estimated radiation exposures to man from all exposure pathways from INEL radiological releases, is included in Section I (Summary) of the final statement.

X.11.2 Comment

"The Summary also states that all radioactive waste streams are monitored by highly sensitive instruments and are carefully controlled. This is a comforting statement, but it is not one which can stand much scrutiny.

The TRA liquid waste is said to be monitored by a gross gamma monitor, which may be highly sensitive but it won't detect some important isotopes. Since some of the waste water is from reactor primary systems and from experimental loops containing reactor fuels, it will certainly contain the fuel material uranium and plutonium and probably americium and curium. None of these materials would be detected by the monitor and there is no mention of these toxic alpha emitters in any of the discussion of the TRA liquid wastes. Where have the radionuclides gone since their discharge to the seepage ponds? Are they present in ducks and antelope which might be killed offsite?"

Response

As indicated, the summary does state that waste streams are monitored by highly sensitive instruments. The monitoring of TRA liquid waste is further described in the text of the statement as continuous, and proportional samples of this waste stream are collected daily. The proportional samples are laboratory counted. A "highly sensitive" spectrometer system with a lithium drifted germanium detector is used to identify all the gamma-emitting isotopes. An aliquot of this sample is also sent to chemistry labs for identification of alpha and beta radiation. Strontium-89 and strontium-90 are generally identified in the TRA liquid wastes by wet chemistry methods. An aliquot of the proportional sample is also dried and gross-counted for alpha activity, which is reported as unidentified alpha. The concentration of alpha activity, which can be attributed to minute quantities of uranium or plutonium in the liquid, is very small. The average unidentified alpha concentration in liquid released to the seepage pond in 1974 was  $2.3 \times 10^{-7}$   $\mu\text{Ci/ml}$ . If all this activity was assumed to be either uranium-235 or plutonium-239,

#### X.11 COMMENT LETTER (Continued)

##### Response (Continued)

the concentrations would still be below the state and federal drinking water guidelines. Drinking water standards for plutonium-239 are  $5 \times 10^{-6}$   $\mu\text{Ci/ml}$  and  $3 \times 10^{-5}$   $\mu\text{Ci/ml}$  for uranium-235.

Alpha spectroscopy methods coupled with radiochemical separations could be used to identify all alpha emitting radioisotopes. However, this is very costly and since daily samples are analyzed, this becomes cost prohibitive when gross alpha analyses show the alpha activity to already be acceptably low.

There is however, as indicated, the possibility of the alpha emitting radioisotopes accumulating in the seepage pond ecosystem. This has been recognized and there are current and ongoing studies of this ecosystem. A study was begun in 1976 to inventory the components of this aquatic ecosystem to determine the amounts of Pu-239, Pu-238, Am-241, Cm-242, and Cm-244 in sediments, water, seston, aufwuchs, zooplankton, phytoplankton, and insects. Tissues of ducks using the pond were also collected. The samples from the first collection period have been submitted for laboratory analyses and the analytical results for the transuranic nuclides should be received in the near future. This particular study is being done with the cooperation of graduate student personnel of Colorado State University. Final results and interpretation of the results should be available within the next two years.

##### X.11.3 Comment

"Iodine-129 has been found in grazing animals on and around INEL. The principal source of the I-129 observed in antelope is the ICPP, as indicated in Table III-X; however, I-129 is not included in the listing of ICPP airborne effluents (Table II-XVIII) and Table III-II indicates the sources of I-129 to be NRF, PBF, and TAN. Iodine-129 is identified in TRA liquid waste but not in ICPP liquid waste in Table III-XVIII. Measurements by the EPA at the NFS fuel reprocessing plant in New York and others by the UKAEA indicate the I-129 is present in both gaseous and liquid effluents from such facilities. It seems clear that no 'highly sensitive instruments' have been used to measure I-129 discharges to the atmosphere and aquifer at the ICPP."

##### Response

Iodine-129 has been released in ICPP airborne effluents over the years and this is identified in Section III.B.1 of the final statement. Calculations of maximum possible release rates, based on calculated I-129 contents of reactor fuel and on fuel processing rates at ICPP, have shown that I-129 has been released well within ERDA release guidelines. Until recently, analysis for I-129 required neutron activation in a reactor and subsequent counting, which was quite expensive and time consuming and was not considered cost-effective. An alternate method has been developed at ICPP recently (1974) for I-129 analysis and has been used routinely for monthly composite samples of liquid effluent and on a nonroutine basis, during development of the method, for airborne effluent.

Iodine-129 has not been detected in ICPP liquid effluent in over two years of analysis for the nuclide. The detection limit for the analytical method used at ICPP is  $2 \times 10^{-9}$   $\mu\text{Ci/ml}$ . Grab samples (taken within the ICPP stack) of airborne effluent while waste calcination was in progress have indicated the presence of I-129 at roughly half the ERDAM 9524 Radioactivity Concentration Guide for an uncontrolled area (for soluble iodine). Even under poor atmospheric diffusion conditions, ground level concentrations are reduced several orders of magnitude because of dilution and dispersion.

The first indication of I-129 buildup in the environment at INEL resulted from analysis of antelope thyroids. This signaled the need for greater emphasis on I-129 monitoring at ICPP and a satisfactory monitoring program is now being developed. The current levels of I-129 in the environs immediately around ICPP are considered far from dangerous but will continue to be monitored to evaluate this potential hazard.

#### X.11 COMMENT LETTER (Continued)

##### Response (Continued)

Recently (1975 through 1976) trace quantities of iodine-129 have been identified in the Snake River Plain aquifer near the ICPP disposal well. These data are included in the final statement (Section III.B.3) and all measured values of iodine-129 are included in appropriate tables of the final statement.

##### X.11.4 Comment

"Table III-XVIII contains no value for 'unidentified alpha' in liquid waste discharges to the aquifer from the ICPP. Does this mean that no alpha activity was detected, that no measurements were made, or that an entry was deleted from the table? Table II-XXIV shows 458 Ci discharged to the aquifer at ICPP in 1974, while Table III-XVIII gives 457 Ci. Is this discrepancy reconciled by the inclusion of the 'unidentified alpha' activity in Table III-XVIII? It is known that the radionuclides uranium-235 and -238; plutonium-238, -239 and -240; americium-241 and curium-242 must have been present in the fuel processed at the ICPP. If alpha-emitters were discharged, then those isotopes would have been present in the effluent stream."

##### Response

Trace quantities of plutonium-238 and plutonium-239/240 have recently (1974) been identified in liquid waste discharges at ICPP. These were inadvertently omitted from the draft statement. The final statement includes a complete radionuclide summary, including the actinides where they have been identified, in appropriate tables of the final statement.

##### X.11.5 Comment

"On page III-81, the draft statement states that only strontium-90 and tritium are detectable in the aquifer 'over a significant area of distribution.' How is that area defined? What other radionuclides have been detected in the aquifer prior to, during, or since 1974? What were the concentrations and over what area were the nuclides distributed?"

##### Response

A long-term study has been made of the distribution and fate of radionuclides in the Snake River Plain aquifer. These radionuclides are a result of discharge to ponds and wells at ICPP and TRA. The wastes have formed waste plumes in the aquifer over an area of about 15 square miles and have migrated about 5.5 miles south of disposal site. The only detectable radionuclides that were in the Snake River Plain aquifer at the time the draft statement was written were strontium-90 and tritium. The area is defined by a network of wells in the area. The concentrations and distribution of the nuclides are shown in various figures in Section III of the final statement.

Limited very recent data<sup>[a]</sup> also show that plutonium-238, plutonium-239 and -240, are present in the aquifer at detectable concentrations in the vicinity of the ICPP disposal well, but the plutonium nuclides are some 2 million fold lower in concentration than permitted by state and federal standards for drinking water used by the general public.

In addition, some analyses of aquifer samples have been made for I-129 content. The highest concentrations of I-129 found were in samples taken from a well about 703 ft down gradient from the ICPP disposal well, and were less than 1/10th the concentrations permitted by state and federal regulations for water in an uncontrolled area. The farthest distance from ICPP the I-129 has been found in detectable concentrations is 6,300 ft. A sampling and analysis program is continuing to define the I-129 distribution in the aquifer.

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[a] W. L. Polzer et al, IDO-12081 (November 1976).

X.11 COMMENT LETTER (Continued)

Response (Continued)

These data are included in Section III.B.3 of the final statement.

X.11.6 Comment

"What are the locations of the 10 acres of permanently dedicated lands discussed on page III-76 and why are the areas so classified? What radionuclides are present and in what amounts? What alternatives to perpetual care were considered?"

Response

The 10 acres that are considered permanently dedicated is the area associated with the TRA seepage pond. Between 1952 and 1974, approximately 41,000 curies of radioactivity have been discharged in liquid wastes to this pond. Only the longer lived isotopes still remain in appreciable quantities. As indicated in Section III.B.3 of the final statement, the residual curie amounts in 1974, after decay, were estimated to be:

strontium-90 - 68 curies  
cesium-137 - 100 curies  
cobalt-60 - 72 curies

These radioisotopes are primarily sorbed upon soil material in the regolith below the pond.

About 6,000 curies of tritium have also been discharged to the pond since 1952. Allowing for decay, about 4,400 curies would remain. The tritium, as tritiated water, follows the same paths as the natural water that is introduced into the pond, i.e., some evaporates and some percolates downward to the aquifer. A discussion of the hydrodynamics of the TRA seepage pond, including tritium is found in Section III.B.3 of the final statement.

X.12 COMMENT LETTER, Dennis Donnelly, 532 North Hayes Ave.,  
Pocatello, ID 83201

X.12.1 Comment

"The introduction to the statement should acknowledge the receipt of waste materials at INEL, which are not acceptable elsewhere, to permit the nuclear industry in this country to keep functioning."

Response

The introduction acknowledges that dry transuranic solids are received from other ERDA facilities and that ICPP processes fuel from government research reactors and the U. S. Navy ship propulsion reactors. Additional details are found in the text. The waste materials from these processes are stored at the Idaho site to take advantage of existing ERDA facilities. The environmental impact associated with these activities is fully described in the statement. The majority of the wastes results from U. S. defense programs. The wastes do not derive from the commercial nuclear industry, although waste storage techniques developed at INEL are applicable to commercial nuclear waste management.

X.12.2 Comment

"How is it that your four-pound document fails to explicate or even note the difficulties with storing transuranic wastes that have caused the states of South Carolina, Kentucky, and New York to refuse to accept these wastes."

X.12 COMMENT LETTER (Continued)

Response

The identified states are locations of commercial burial grounds for non-high-level solid nuclear wastes. These facilities support the commercial nuclear industry. ERDA is managing U. S. government produced nuclear wastes. The scope of the statement is to describe the environmental impacts associated with waste management operations at the INEL. These are described in the statement. The environmental impacts at other waste storage sites are based upon characteristics of those sites, i.e., operating procedures, geology, climatology, and hydrology. It would be inappropriate and certainly outside the scope of this statement to include discussions of commercial sites.

X.12.3 Comment

[The background discussion in Section 1 of the Draft Statement] "mentions the original mission of INEL was for research and testing purposes. It fails to mention why or when the terrible additional burdens of nuclear fuels reprocessing and storage of wastes from other sites were added to the list."

Response

In Section I of the final statement there are introductory statements that indicate: "INEL was established as an area where various types of nuclear reactors, support plants, and equipment could be built, tested, and operated with maximum safety. In addition to the reactor facilities above, the Idaho Chemical Processing Plant is located at INEL. It is operated to recover uranium by processing spent fuel from government-owned reactors. At this facility improved fuel reprocessing and waste management methods are being developed. Burial grounds also are located at INEL for burial and storage of various forms of radioactive waste." These are summary statements to alert the reader to the existence of these facilities. Additional details are found in the appropriate sections of the statement.

X.12.4 Comment

"Another major gap is this document's use of 1970 through 1974 average waste volumes to project health effects to the year 2020 (see page III-122). ERDA regularly publishes its projections for growth of the nuclear industry. Instead of looking at the past and predicting constant throughputs until 2020, your Draft Environmental Statement should use ERDA projections and divulge plans for expected throughput at INEL in this critical estimate of health effects.

This 'constant volume' projection ignores both the volume growth indicated by the jump in 1974 over 10-year average volume (page I-2), and the current construction of a second fuel reprocessing facility to increase the throughput at ICPP. I find the self-serving distortion resulting from this shallow analysis to be highly objectionable."

Response

ERDA projections on the growth of the nuclear industry relate to the commercial production of electricity. As described in the summary of the final statement, a total of 51 nuclear reactors have been built at INEL and only 17 are still operable. The continued operation of the remaining 17 and the construction of any new facilities will be based upon future and continuing research and engineering requirements and in no way is expected to follow the growth of the commercial industry. A discussion on the near future volumes of waste at INEL has been included in the Foreword of the final statement.

There is not a "second fuel-processing facility" under construction at INEL. As discussed in the summary of the final statement, a new waste calciner is being constructed. The calciner will provide increased efficiency and radiological controls for the conversion of high-level

X.12 COMMENT LETTER (Continued)

Response (Continued)

liquid waste to a solid form. An environmental statement has been written for the new waste calciner facility and is referenced in the final statement.

X.12.5 Comment

"I object also to your projecting health effects for 100 to 150 years, when the problems you're creating will last a million years and more. Our ability to manage these problems just isn't equal to the problems. Your notion of stewardship seems to be to look at 1/10,000th of the problem in a shallow fashion, then to assure our citizens that the problems are well in hand. I'm not satisfied that they are."

Response

The projections of health effects into the future are based upon EPA guidance, as referenced in the statement. As stated by EPA, "Because of the difficulty of making projections of radionuclide transport on the basis of present knowledge, these potential consequences have been calculated only for the first one-hundred-year period following release." The ERDA staff feels this is a reasonable approach.

X.12.6 Comment

"The last paragraph on page II-2 is grossly incomplete without mention of the Big and Little Lost Rivers, and Birch Creek, with note that these flow onto the INEL site, and percolate through the surface layers down into the aquifer. Even though this is made clear later in the document, it should also be part of your initial description of the hydrology of INEL, due to its major implications for the suitability of INEL for long-term waste storage (or were these implications why it was omitted?)."

"The map on page II-5 should indicate the boundaries of the aquifer by shading, else your initial 'detailed description' has the major shortcoming that the reader has to get clear to page II-299 before seeing a schematic of the aquifer."

Response

The summary material provides an overview of the material in the statement and it is not intended to replace detailed information in the text. The summary explains that surface water runs onto INEL and that there is a body of water underlying INEL. The details of the hydrology of INEL are found in Section II.C.8 of the statement.

A figure has been included in Section II.A of the final statement which shows the Snake River Plain aquifer in eastern Idaho.

X.12.7 Comment

"On page I-2 it is pointed out that 34 reactors at INEL have completed their missions and are inactive now. An 'active' decontamination and decommissioning effort is mentioned, but the objectives of this program are not made clear. I feel that Idahoans should be assured that your decontamination and decommissioning efforts will restore the land in question to full, unrestricted use in the near future. These 'D&D' programs should be funded as part of the startup costs of the reactors, instead of after-the-fact, as mentioned on page II-264. Only then will the real costs of this equipment be shown to be as staggering as it seems to this observer. Only then will the stewardship of our generation be properly exercised, instead of dumping the costs with the problems onto future generations."

X.12 COMMENT LETTER (Continued)

Response

The ERDA policies and criteria for Decontamination and Decommissioning (D&D) are given in Reference 3 of the final statement. Frequently D&D efforts are directed not at restoring land to completely unrestricted use (e.g., for grazing), but rather to permit the facilities to be safely used for other purposes, either nuclear or nonnuclear.

It is true, as the comment suggests, that costs of complete restoration of the land to its original condition for unrestricted use might, in some cases, be "staggering." Before undertaking such a task, a cost-benefit analysis would be required to determine whether complete restoration was appropriate at that time. For some installations, as for example the ICPP plant with its massive concrete shielding, it seems most probable that complete restoration to the original desert land condition before the plant was constructed would never be justified. In brief, construction of some of the installations at INEL is essentially irreversible when it comes to restoring land to full unrestricted use in the setting existing prior to construction.

X.12.8 Comment

"On page II-267, the description of the waste solidification process is incomplete . . . . not mentioned are the radioactive volatiles which are driven off by the calciner. These are simply vented to the atmosphere, and they constitute about 1/8 of the total radioactivity in the high-level wastes being solidified. I am very disturbed by ERDA assurances that a quarter million curies of radioactivity in our air each year is OK because it is sufficiently diluted with clean air."

Response

A more complete description of the off-gas cleanup system associated with the waste solidification (calcining) process is presented in Section II.A.3 of the final statement. Extensive provisions are included for removal of radioactive volatiles, mists, and particulates before release of the effluent stream to the atmosphere through the Atmospheric Protection System, a final HEPA filtering system added during 1975. During 1974, approximately 97.7% of the airborne activity released from ICPP consisted of krypton-85 (a gas with a 10.76 year half-life). This gas is released during fuel dissolution, not waste solidification, and is not removed by filtering or other currently employed devices. Although the release concentrations of this nuclide are far below RCG values, ERDA is concerned with possible buildup on a worldwide basis when more fuel processing plants go on-line. Removal of noble gases from an effluent stream is technologically feasible, but safe storage of the removed concentrated radioactive gas presents safety problems also. The environmental impacts resulting from the release of krypton-85 and other noble gases are presented in Section III.B.1 of the statement.

X.12.9 Comment

"The weather studies of the INEL region, on page II-274 et seq., overlook the major fact that the upper Snake River basin forms one of the largest, if not the largest, natural temperature-inversion regions in the world. The air at Pocatello was heavily fouled this year by range fires clear over at Mountain Home, for example. This means that your climatology studies are grossly inadequate to the task of predicting the population exposures resulting from radioactive releases to the atmosphere at INEL. Note the table on page III-57 showing the cesium-137 concentrations in the sheep from Humphrey, Idaho (some 70 miles from ICPP) to be about ten times greater than in the sheep from communities closer to the INEL site. No mention is made of this peculiar datum in the Draft Environmental Statement."

Response

The NOAA has operated a meteorological observation program at INEL since 1949. In addition to recording day-to-day weather data and providing daily operational forecasts for INEL, the

X.12 COMMENT LETTER (Continued)

Response (Continued)

NOAA staff has maintained an intensive research and development program to improve the reliability of prediction and measurement of meteorological parameters which influence safe conduct of operations on INEL. A number of meteorological stations are located throughout INEL to measure simultaneously the spatial variation of several meteorological parameters such as temperature, wind speed, and direction up to a height of 250 ft. The meteorology at INEL is as well studied as any region of the U.S. A summary of the INEL climatology is found in Section II.C.5 of the statement.

Additional detailed climatological data can be found in References 57 through 60 of the statement.

The significance of the high cesium-137 concentration in sheep at Humphrey, Idaho is based more upon the date the sample was collected -- not the distance from INEL. As discussed in the statement (Section III.B.2) the high concentrations of cesium-137 in the animal tissue collected near Humphrey, Idaho on August 30, 1974 are attributed to fallout from a foreign atmospheric nuclear test which was conducted two months prior to the date the animal sample was taken.

X.12.10 Comment

"In fact, there is precious little information in this whole book relative to biological sampling of wildlife or domestic animals in the INEL region. I know this sampling goes on all the time; the results are just excluded from your draft statement. To convince the public (and me) that nuclear operations at the INEL site are not in fact contaminating the region, you should include abundant data on biological sampling of all kinds of plants and animals--preferably conducted by a disinterested organization such as the biology department at Idaho State University (which does a good deal of this type of monitoring)."

Response

The draft statement presents the available data as of December 31, 1974. The biological sampling has been expanded in recent years and there are numerous biological studies currently in progress at INEL. The majority of the ecological studies are being conducted by personnel and graduate students from Idaho State University, University of Idaho, Colorado State University, Utah State University, and the University of Minnesota. Personnel from the Idaho Department of Fish and Game and the U. S. Fish and Wildlife Service are also involved. Therefore, much of the biological data is being collected and interpreted by "disinterested" organizations such as suggested. These studies are summarized in Appendix E of the final statement.

X.12.11 Comment

"The final paragraph on page VI-2 seems to contain outright lies. 'The disposal of liquid wastes to the aquifer, either radioactive or nonradioactive, involves only a short-term commitment.' -- What? Tritium is one of the materials requiring 'perpetual' surveillance (according to the information on page I-16), and tritium is the largest radioactivity released to the aquifer. The author's commitment to manage the problem may be short-term, but the problem is not.

'If disposal of waste effluents were discontinued, the effects would probably not be distinguishable at any location within 10 years.' See Figure III-34 (on page III-38) for another view of this, which completely contradicts this claim!"

Response

The subject paragraph has been clarified in the final statement.

X.12 COMMENT LETTER (Continued)

X.12.12 Comment

"My final comment is to deplore this document's defense of the soundness of INEL as a waste repository. The decision to site the nuclear waste storage complex and the nuclear fuels reprocessing operations right over the Snake River aquifer, very close to the Big Lost River--which percolates down into the aquifer in this area--and in a volcanically/seismically active area to boot, was about as bad a decision as could be made on this problem.

Could it be that this region of abundant hydrology was selected on purpose? It certainly is possible that future security problems will make it necessary for reactors to be located at the same site as fuel reprocessing and waste storage facilities. In that case, the huge Idaho site makes some sense that a sinister ERDA isn't telling us about."

Response

There is no plan no current consideration to place a "power park," where reactors, reprocessing, and waste storage are located over or near the Snake River Plain aquifer. INEL was developed for and continues to be intended for use as a research and development area. Certainly any commercial power park would require a thorough extensive public environmental impact assessment.

Prior to startup of the first reactors at the Idaho site a need was recognized for disposal of onsite generated radioactive waste material. Consideration was first given to other processing methods, such as incineration, but because of the availability of the vast desert areas on the site, land burial of the waste was considered the most economical approach. Since geologic and hydrologic conditions had to be considered, the U. S. Geological Survey (USGS) was consulted. After the USGS had drilled test holes they recommended the waste management complex be located in its present location. The waste management complex has operated for nearly 25 yr with only the minor environmental impact described in the statement. There is no evidence that the aquifer is threatened from this program.

Seismology and hydrology characteristics of the site are presented in Section II.C.7.8 of the statement. Data indicate that the Snake River Plain is essentially aseismic and is seismically "decoupled" from the mountains surrounding it. ERDA and USGS are continually monitoring and evaluating the hydrology of the area and the potential for leaching of buried radionuclides and movement toward the aquifer. Two reports have recently been published on this subject: (1) IDO-22056, Hydrology of the Solid Waste Burial Ground, and Related to the Potential Migration of Radionuclides, INEL; USGS August 1976; and (2) IDO-10065, The 1975 RWMC Core Drilling Program, W. H. Burgus, July 1976. The reports are summarized and referenced in the final statement (Section III.B.5).

X.12.13 Comment

"One more comment pointing to a major environmental omission in the draft statement: A recent analysis (Radiation Data and Reports, December 1974, p. 767.) shows that with current techniques, all the current commercially operated waste burial sites will be full by 1998. This implies a continued need for more land to be totally committed to this function, soon and forever. This draft statement completely ignores this need, and assures the reader that a constant 210 acres is all that will ever be needed. I somehow doubt that."

Response

The cited report evaluates the needs of commercially operated burial grounds to support the commercial nuclear industry. The solid wastes stored or disposed at INEL are government produced wastes.

X.12 COMMENT LETTER (Continued)

Response (Continued)

It is ERDA's intent to continue to manage its own nuclear waste material. By applying space conservation methods, the dedicated land at the Radioactive Waste Management Complex (RWMC) is not expected to change in the foreseeable future. If additional lands are ever required, appropriate analyses will be developed and evaluated prior to the use of such lands.

X.13 COMMENT LETTER, Neal Wilson, 5 Brock Rd., Enfield, CT 06082

Comment

"With the INEL fuel processing and releasing relatively long-lived gaseous isotopes to the atmosphere, the article 'Meteorological Consequences of Atmospheric Krypton-85' (Science, Vol. 193, pg. 5195-198, July 16, 1976) should be addressed in some depth in order to nip a new opposition in the bud."

Response

With respect to the referenced article in SCIENCE, the following observations and information are given:

- (a) The article develops an unconfirmed model describing possible changes in atmospheric conductivity due to ionization from Kr-85 released to the atmosphere by nuclear fuel reprocessing plants. The model incorporates several parameters which have not yet been accurately evaluated.
- (b) Although the model may have some validity and may, to some unknown degree, describe potential changes in the atmospheric electric circuit, our present understanding of atmospheric processes does not (as the author admits) permit predictions of the kinds and extent, if any, of resulting changes in the weather.
- (c) It is of interest that EPA has proposed regulations which will restrict releases of Kr-85 to the atmosphere and require that it be trapped and stored instead of releasing it. However, such regulations have not as yet been put into effect. Since reprocessing of large quantities of commercial power reactor fuel is still some years ahead, the sizeable quantities of Kr-85 which the article's author refers to, are not of immediate concern. Meanwhile development of Kr-85 trapping processes and storage methods is continuing, the latter involving research and development at INEL.

X.14 COMMENT LETTER, Scott Harris et al, 16 South 11th St., Payette, ID 83661

Comment

"The site is located above the Snake River aquifer, a highly permeable layer characterized by large flows of underground water which surface into the Snake River. It may take many years for wastes already accidentally and deliberately dumped into the water table to surface in rivers and wells but the wastes proposed to be stored have many thousands of years to make that journey and still retain their toxicity. For instance, plutonium-239, an inevitable by-product of the breeder reactor situated at Arco, possesses a half-life of 30,000 years.

X.14 COMMENT LETTER (Continued)

Comment (Continued)

Ten pounds of this waste, dispersed evenly throughout the atmosphere, would cause everyone in the world to contract lung cancer. This by-product has no use except in the production of plutonium bombs. It will dissolve a steel drum in 3 years and a stainless steel drum in 20. In order to safely store this waste you must guarantee the existence of a governmental system which will, without a single failure, contain this grim legacy for a time period which exceeds by 50 times the span of any single governmental system in history. Can you, personally and for the sake of all people, guarantee this stability?"

Response

Plutonium-239 has a half-life of 24,400 yr and rather than being a by-product, is the desired principal product of and fuel for most breeder reactors. It then represents a step in the potential utilization of nuclear power as an almost unlimited energy resource. It is of interest that from atmospheric weapons tests carried on by the U.S. and foreign countries in the past, several tons of plutonium have already been fairly evenly dispersed in the atmosphere. There is no substantial evidence to date that anyone, anywhere has contracted lung cancer from this source. Plutonium does not dissolve steel drums in 3 yr or stainless steel drums in 20 yr.

At INEL much of the plutonium waste is stored temporarily in steel drums in an aboveground storage area of RWMC, pending shipment to an as yet undesignated government repository for final safe disposal. The balance of plutonium wastes, generated before 1970, was buried in the ground (in barrels and boxes). ERDA currently has an extensive study underway to evaluate the feasibility, costs and hazards of exhuming this waste for transfer to the aforementioned government repository for final safe disposal under conditions in which the waste cannot enter the biosphere at any time before it has decayed to harmless levels. This study will be completed in late 1977 and an environmental impact statement published for review and comment by all parties concerned. This study is discussed in the Foreword of the final statement.

X.15 COMMENT LETTER, Cecil D. Andrus, Governor, State of Idaho, Boise, ID 83702  
(with comments from the Department of Health and Welfare)

Comment (Governor)

The omission from the draft environmental statement of discussion of a commitment by the AEC to remove certain radioactive wastes from INEL is criticized, with a request that the commitment be stated in the final and its fulfillment be discussed.

Response

This important omission has been corrected in the final statement. A new section (III.B.5.f) discusses the controversy over burial of transuranic wastes at the INEL, statements and actions of the AEC concerning these wastes, and planning by ERDA concerning their long-term management. (New section begins on page III-91.)

X.15.1 Comment (Department of Health and Welfare)

"Big Lost River Channel. It is pointed out in the draft statement that no surface water flows away from the INEL; however, water does flow onto the INEL site and then off again as ground-water drainage to the Snake Plain aquifer. The Big Lost River, for example, flows within 1.5 miles of the RWMC where millions of curies of radioactive materials are buried and stored. The statement doesn't examine the possibility of the lateral flow between the channel and the disposal site. Why aren't surface waters in the Big Lost River monitored?"

#### X.15 COMMENT LETTER (Continued)

##### Response

The flow of the Big Lost River on INEL has been monitored by three continuous water-stage recorders since 1965. The discharge has ranged from zero on many occasions to 2,215 ft<sup>3</sup>/sec on June 29, 1965. The discharge in 1965 was the highest on record and was probably the highest flow since 1894.

Ground water recharge from the Big Lost River does move downward to the Snake River Plain aquifer and then southward. Generally, about one-half of the flow is channeled into the INEL diversion and the remainder flows northward to the Big Lost River playas where it terminates. The effects of this recharge have been determined.

The capacity of the INEL diversion system near the southwest corner of INEL is about 3,500 ft<sup>3</sup>/sec, which constitutes a flood with a recurrence interval of once in 50 yr. Under present conditions, a flood of greater magnitude than 3,500 ft<sup>3</sup>/sec could overtop the diversion dam and flow toward the Radioactive Waste Management Complex (RWMC). The surface elevation of these flood waters at this flow would be 5,559 ft above MSL, which is some 45 or 50 ft higher than the elevation of the RWMC. Thus, lateral flow of the Big Lost River at the INEL diversion to the RWMC is possible when very high flood flows overtop the diversion dam. The distance is about two miles. However, a two-day warning would permit heavy equipment to be utilized to close some gaps in a basalt ridge between the Big Lost River and RWMC.

If RWMC were flooded, flood waters would run off and follow a channel to the northwest. This channel eventually drains back into the Big Lost River four miles northeast of RWMC at an elevation of about 4,980 ft above MSL.

Because no radioactive waste has ever been discharged to the Big Lost River, few water samples on INEL are available for radiometric analyses. However, analyses of three Big Lost River samples collected in November 1976 at different locations detected no radionuclides. In addition, samples of fish and bottom-dwelling organisms which would tend to concentrate the radionuclides, if present, are being collected and analysed.

##### X.15.2 Comment

"Radioactive Waste and Scrap Facility. The draft doesn't provide an analysis for the millions of curies of radioactive waste stored at ANL-W (p. II-49). Is this waste mixed fission products? Transuranics? What are the eventual plans for the deposition of this waste?"

##### Response

Text changes made in Section II.A.9.

##### X.15.3 Comment

"High-Level Liquid Radioactive Wastes - Tank Storage. As noted on page II-97, large quantities of high-level liquid radioactive wastes are stored at a tank farm adjacent to the ICPP. The draft statement minimizes at length the probability of tank rupture, whatever the cause (earthquake, sabotage, etc.). Nonetheless, the statement should examine the environmental burden posed for the Snake Plain aquifer should the wastes reach it. For example, what quantities of radioactive materials would be deposited in the aquifer? What concentrations are involved? What of the suitability of the aquifer for continued use as irrigation and drinking waters? This estimation of potential aquifer damage cannot be ignored in the preparation of this environmental statement."

##### Response

The probability of a catastrophic rupture of a high-level waste storage tank has been examined in numerous hazards analyses<sup>[a]</sup>. The only mechanisms postulated for initiating such a rupture are: (1) major earthquake, (2) sabotage through use of large quantities of high explosives, and (3) a radiolytic hydrogen explosion. These initiating mechanisms are considered of such

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[a] A. G. Westa and C. N. Fitch, ICPP SRD Section 4.2, ACI-216, to be published.

#### X.15 COMMENT LETTER (Continued)

##### Response (Continued)

low probability as to be considered incredible. For this reason, no extensive analysis has been undertaken to determine possible effects of tank failure on the Snake Plain aquifer.

It should be pointed out that after the new waste calciner is put into operation at ICPP the volumes of high-level liquid wastes now stored will be reduced to small, then-current operational quantities. Presently stored waste will be converted to solid, immobile, granular calcine, and any postulated threat to the aquifer (from liquid storage tank rupture) will be markedly diminished.

##### X.15.4 Comment

"Future Wastes at INEL. The draft statement notes that only ERDA-generated radioactive wastes have been buried or stored at INEL. The sources of future wastes are not discussed; for example, will commercial transuranic wastes be stored or buried at this government-controlled facility? Only recently, there was a ruling that commercial transuranic wastes in concentrations of 10 nanocuries/gram or greater cannot be buried at commercial waste sites. Such wastes are required to be sent to a federal government facility for storage or eventual disposal. Do future plans call for INEL to be such a storage facility for commercial transuranics?"

##### Response

There are no current or projected plans to accept commercial waste at INEL.

##### X.15.5 Comment

"EBR-I Wastes. The draft statement specifies the reason that the quantities and characteristics of radioactive wastes generated by EBR-I are not available."

##### Response

In the early days of operation of EBR-I records of the quantities and characteristics of radioactive wastes were not kept. However, such wastes were sent to RWMC for burial and represent only a very small fraction of wastes at RWMC.

##### X.15.6 Comment

"Environmental Surveillance Program. The draft statement describes an environmental radiation surveillance program conducted by ERDA (HSL), USGS and NOAA. Who reviews and interprets the results of these monitoring data?"

##### Response

The results of the environmental radiation surveillance programs are published annually and staff interpretations of data are provided within these reports. Further review and interpretations can, of course, be made by any reader of these publicly disseminated documents.

USGS reports receive extensive review and criticism by various appropriate USGS offices in Washington, Denver, etc., and reports are issued only after comments and critiques have been factored into the information and interpretations presented.

Many of the environmental sampling and analysis programs are conducted in conjunction with universities, utilizing onsite graduate students. The individual efforts of the graduate students are always monitored by their professors at the institution from which they came. Thus academic input is an important factor in overall review and interpretation.

X.15 COMMENT LETTER (Continued)

Response (Continued)

Most NOAA activities are carried on largely in support of environmental surveillance programs and many of NOAA findings consist of weather observations and measurements (wind velocities, directions, etc.). These NOAA efforts procedure primarily raw data used in support of other activities, including environmental assessments.

X.15.7 Comment

"Plutonium Soil Contamination. The draft statement describes plutonium contamination in the vicinity of the RWMC and other INEL facilities (page III-381). No explanation for the origin of this contamination is given. The historical trends for this contamination is not discussed; e.g., is it increasing or stable? Plutonium levels are discussed in terms of 'so many times those levels from the offsite average.' This type of quantification does not permit an evaluation of the magnitude of the plutonium contamination problem. Too, the draft statement doesn't discuss the plutonium resuspension factor around the RWMC or other INEL facilities."

Response

The origin of this contamination is the result of local flooding of the area in 1962 and 1969 (Section III.B.5). Comparisons are made with offsite averages since worldwide fallout (Section III.B.1) occurs offsite as well as onsite. Historical trends cannot be established at this time since data have only been gathered over the past three to four years.

As recommended, Figure III-26 is refined in the final statement and data are presented in the text to quantify plutonium contamination.

Plutonium resuspension is discussed Section III.B.5, together with potential dose assessments for RWMC and adjacent environs.

X.15.8 Comment

"High-Level Liquid Radioactive Waste Transfer Pipe Leaks. The draft statement notes the 'discovery' on three separate occasions of high-level radioactive liquids having breached the underground transfer piping network and contaminated subsurface soils within the ICPP complex. In each instance, the bodies of contaminated soil were unsuspected and were 'discovered' in the course of a routine work assignment. As there is no positive assurance that other unsuspected leaks have not occurred, the draft statement should describe a program to leak test all waste lines in the tank farm vicinity. Too, such an evaluation should be repeated at reasonable intervals.

As in the case of tank rupture, the draft statement should examine the environmental burden placed upon the Snake Plain aquifer had these known leaks reached it."

Response

Following discovery of the high-level liquid transfer line leak on October 1, 1974, an extensive program for leak testing of waste transfer lines adjacent to the ICPP tank farm was initiated. All such lines were pressure-tested using helium. In two instances where helium leaks were found, the suspect lines were rechecked using pressurized water. No liquid leaks were found. Leak testing of these lines is now conducted at frequent intervals. A complete discussion of current and future programs, together with the improvements in tank farm leak detection methods is provided in Appendix E of the final statement.

In the final statement a discussion of environmental burden on the Snake River Plain aquifer is not included because all radioactivity is known to have been fixed in the overburden and did not even remotely threaten the aquifer.